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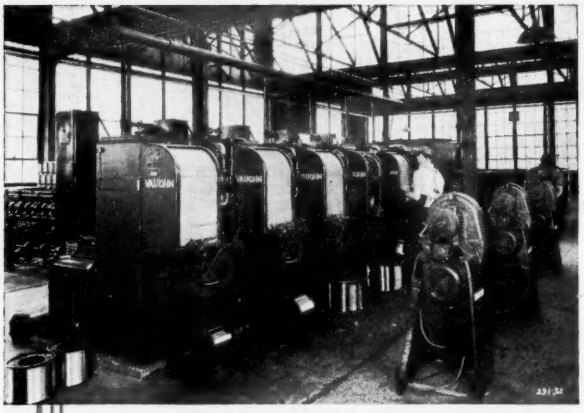

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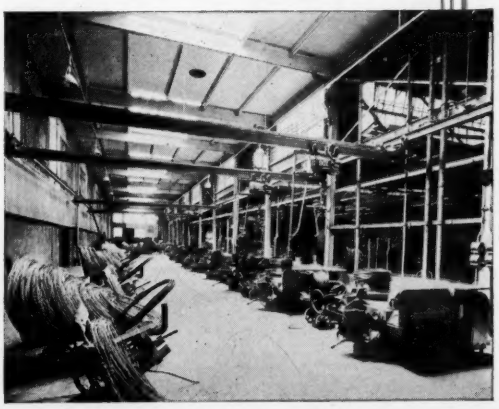
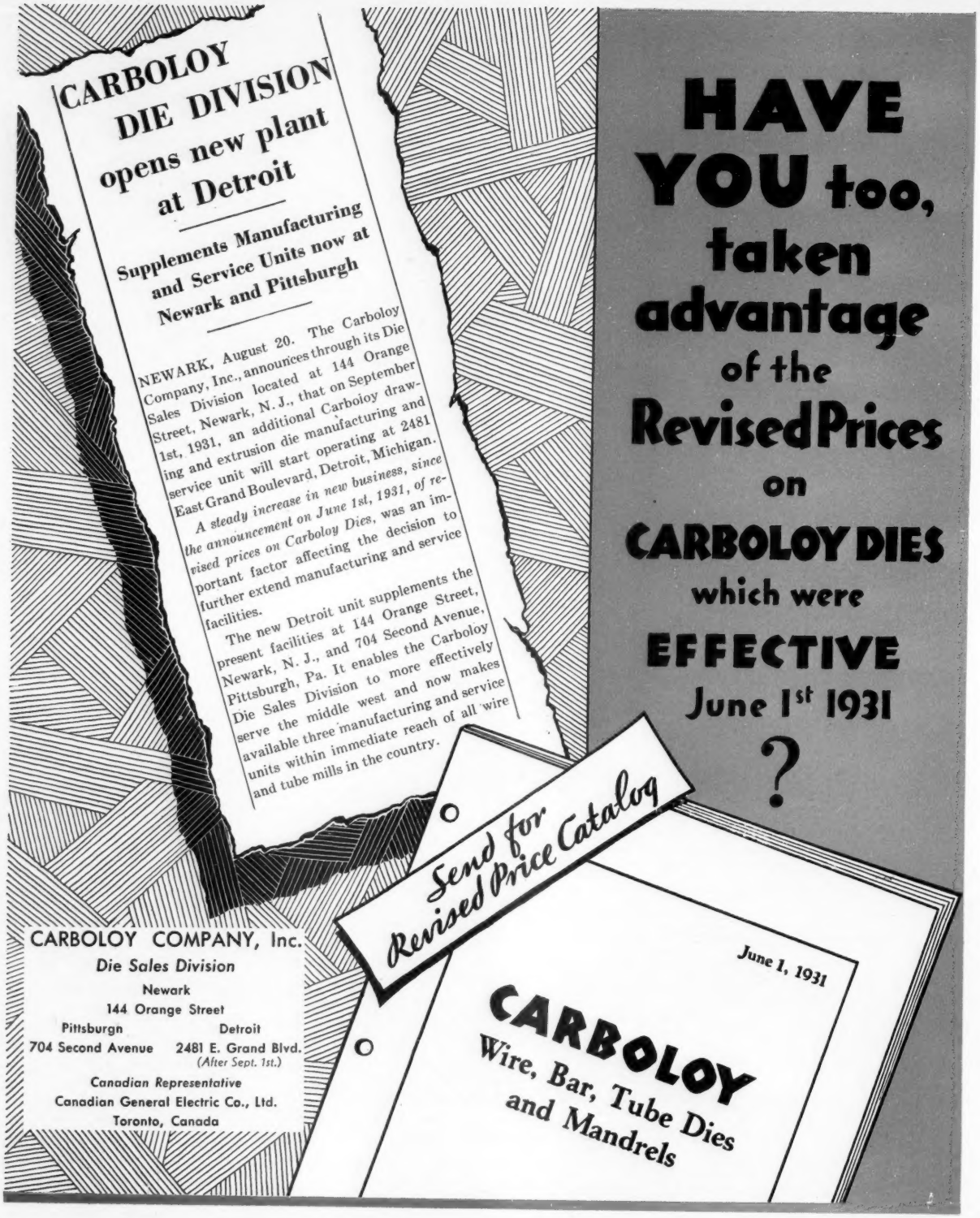


Double Deck Motoblocs drawing steel wire (Patented).

September 1931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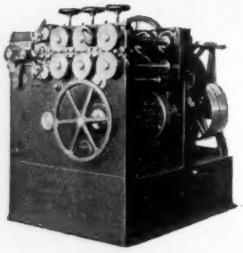
MODERN SPRING MACHINERY

Universal Spring Coiling Machines



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No. 3—Series 318

are made in 11 sizes, handling cold oil-tempered wire from .004" to 5/8" diameter. They operate automatically, feeding, coiling and cutting with extreme speed and accuracy.

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Torsion Spring Machines

must be fast, accurate and powerful to maintain pace with the modern trend.

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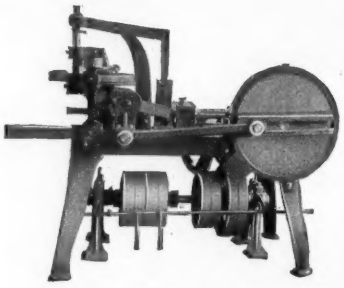
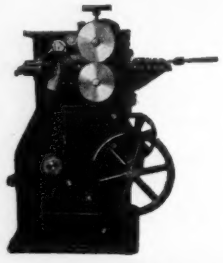


Torsion Spring Machine
No. 2—Series 270



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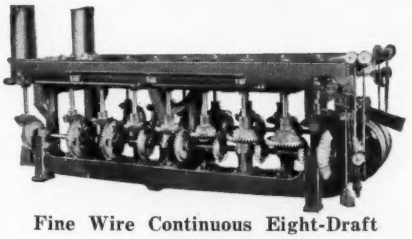
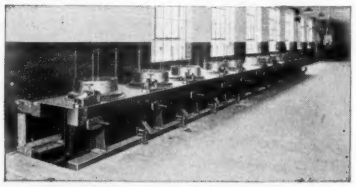
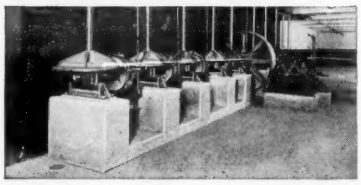


Fine Wire Continuous Eight-Draft Wet Machine





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Other sizes of Single Hole machines are made by us to meet any requirement. All are noted for sturdy construction, ease of adjustment and modern lubrication systems. Cut steel gears are used throughout.

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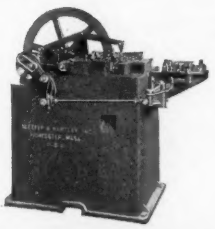

Wire Nail Machine No. 2

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A monthly publication devoted to the production of Wire, Rod and Strip. Wire Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING.

Vol. 6 September 1931 No. 9

Official Publication of The Wire Association

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551 Fifth Avenue, New York City. Telephone: Murray Hill 2-10191

Publication Office: Washington, N. J.

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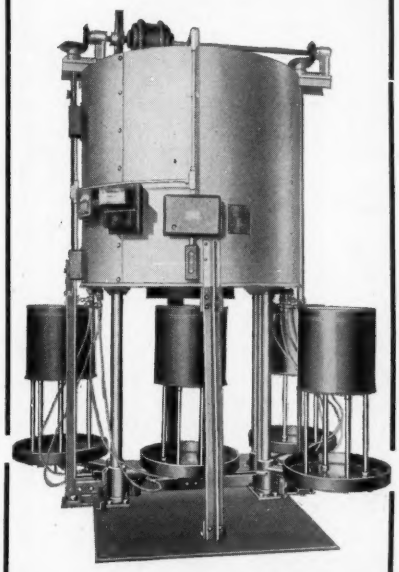

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A Monthly Publication Devoted to the Production of Wire and Wire Products in all Metals from the Bar to the Finished Wire Product.

Vol. 6 SEPTEMBER, 1931 No. 9

Wire Mill Cost Accounting

By L. D. Granger

Wickwire Spencer Steel Co., New York, N. Y.

A paper presented at the annual meeting of the Wire Association outlining an understandable method of cost accounting for wire mills. ▲▲▲▲▲

TOO often costs appear to the foreman to be some mysterious figures that are furnished to superintendent so that embarrassing questions may be asked as to why it cost more this month to clean or anneal a ton of wire that it did last month. His reaction is often antagonistic, and he feels the figures aren't worth the paper they are written on, as he knows there were no unusual expenses during the month. His distrust is often caused by his not knowing how the costs are made or what they cover.

Really, however, accurate costs are not difficult to obtain nor to understand if we approach them in such a way as to know how they are put up, and what they mean. In the present day of ruthless competition—from abroad as well as among ourselves—the most important job we have is to analyze our operations, see where we can cut corners, and how we can make wire more cheaply.

Principal Cost Items

THE cost of any operation is made up of three major items —materials, labor, and that necessary evil—overhead.

Let us take these up in order and see just what each comprises.

"Materials" are what the product is made of. There is a distinction made between "materials" and "supplies" usually expressed by the statement that materials are shipped as a part of the finished product, and supplies vanish in the process of manufacture. Rods, and zinc and tin for coatings are materials, but acid, lime, soap, greases and such are supplies, and are reported in the overhead items. The value of materials and supplies used is easy to get, as reported by issues from stores, properly adjusted for the amounts on hand in the department at the first and last of the period.

Vice President
The Wire Association
L. D. GRANGER
Chief Metallurgist,
Wickwire Spencer Steel Co.,
New York, N. Y.

By **"Labor,"** we mean direct, or producing labor, and here there is room for disagreement and discussion on fine points. Some of us like to feel that nothing should be classed as direct labor that does not increase the value of the product. Thus wire drawing is, of course, direct, but wheeling and other such operations are indirect labor, and thus classed as overhead. The exact definitions are not extremely important except when we wish to compare our costs with those of other mills. Then it is necessary that all the costs to be compared must be built up in exactly the same manner and in each case the same items recorded as direct and indirect expenses.

"Overhead" is the basket into which everything else is thrown, and too often it is so scrambled that it is difficult if not impossible to pull it apart. The fineness of detail in which overhead is recorded and the degree to which it may be analyzed in its various items is

Typical Wire Mill Cost Sheet "A"

COST OF ANNEALING - 350 NET TONS AVERAGE GAGE 11 MARCH 1931.

	ITEMS	AMOUNT	COST PER TON Actual	COST PER TON Standard	VARIATION. Over	VARIATION. Under
1	DIRECT LABOR	420 00	1.20	1.25		.05
	INDIRECT LABOR					
2	Supt - Foremen, Clerks, Etc.	24 50	.07	.06	.01	
3	Janitors Sweepers.	3 50	.01	.015		.005
4	Miscellaneous.	7 00	.02	.015	.005	
5	TOTAL INDIRECT LABOR	35 00	.10	.090	.01	
6	TOTAL LABOR.	455 00	1.30	1.34		.04
	INDIRECT SUPPLIES & EXPENSE					
7	Tools and Supplies	17 50	.05	.05		-
8	Lubricants	70	.002	.003		.001
9	Electric Power & Light	10 50	.03	.035		.005
10	Steam	-	-	-		
11	Water	-	-	-		
12	Misc Supplies	35	.001	-	.001	
13	Liability Insurance	6 30	.018	.02		.002
14	Acids	-	-	-		
15	Lime	-	-	-		
16	Inhibitors	-	-	-		
17	Dies	-	-	-		
18	Tubs	-	-	-		
19	Coal & Gas	885 50	2.53	2.45	.08	
20	Fuel Oil	-	-			
21	Trucking	87 50	.25	.30		.05
22	Department Burden	70 00	.20	.20	-	-
23	Stores Expense	10 50	.03	.05		.02
24	Packing Supplies	-	-	-		
25	Laboratory	-	-	-		
26	TOTAL IND. SUP. & EXP.	1,088 85	3.111	3.108	.003	
	REPAIRS & MAINTENANCE.					
27	Labor	35 00	.10	.15		.05
28	Material	7 00	.02	.03		.01
29	Burden	14 00	.04	.05		.01
30	TOTAL R & M.	56 00	.16	.23		.07
31	PLANT BURDEN	175 00	.50	.45	.05	
32	COST ABOVE LABOR	1,319 85	3.771	3.788		.017
33	TOTAL COST	1,774 85	5.071	5.128		.057

34	DISTRIBUTION.	Amount	Tons
35	Rod Frames H.C.	25 36	5.0
36	" " L.C.	1,274 34	251.3
37	15 Frame H.C.	-	-
38	" L.C.	153 14	30.2
39	Coarse Wet H.C.	83 67	16.5
40	" " L.C.	136 92	27.0
41	Galvanizing	101 42	20.0
42	Tinning	-	-
43	Total	1,774 85	350.0

TABLE "A".

one measure of the efficiency of a cost system. The main efforts of a cost reduction campaign may often be directed at these overhead items with surprising results.

Overhead, as well as labor, is divided into two classes, direct and indirect, that is, into items directly incurred by the department as contrasted with the items of expense of the mill in general which are divided among the different departments. A general rule that is good to follow however is to charge all expenses possible directly to the department or process itself and to keep the general or distributed items small in amount. The items that usually must be distributed are taxes, plant insurance, steam for heating, general repairs and maintenance, general plant salaries, telephone, and supplies not directly chargeable to any department. Many of these are fixed expenses and distributed in an arbitrary manner, and may, if not carefully analyzed, put an improper charge on some departments. The distribution should be carefully studied so as to be as fair as possible.

To sum up the foregoing paragraphs in a tabular form, we have the cost of manufacture itemized as follows:—

A—Materials
B—Direct Labor
C—Overhead
I—Direct charges
a—Indirect labor
b—Supplies and expense
II—Indirect charges
a—Mill expenses
b—General expenses

Perhaps the best way to get the picture as a whole is to reproduce a typical "cost sheet" and discuss each item, see where it comes from, and what it means.

(See Table "A")

Explanation of General Cost Analysis Sheet

THIS cost exhibit is a generalized form, and may be used for several operations by the insertion of the proper heading. On account of its being a process cost, no materials are charged. This sheet shows the cost of annealing wire for March, 1931 in our typical mill. The actual figures are, of course, arbitrary, and are not to be considered as any indication of what the cost should be, and, by the way, any mill in which it costs $5.00 a ton to anneal would be headed for the scrap heap.

We will assume that the accounting department is operating satisfactorily, and that the expenses have been previously recorded in various "exhibits" such as cost of producing steam, cost of water, power, oil, trucking, and all the various items of expense, and that each of these exhibits carries its "distribution," as on the bottom of sheet "A", whereby the total expenses are properly distributed to the various manufacturing departments.

We will also assume that provision has been made to charge directly to the department itself the power, steam, gas, oil, coal, etc. that it uses, leaving only small amounts not so charged to be distributed as general items.

In short, we assume that all the bookkeeping has been properly done, as we are interested in the analysis of the results, and not in the method of recording the figures.

First of all we note the heading —"Cost of Annealing 350 Net Tons, Average Gage 11." If our annealing house has a capacity of 750 tons, we see at a glance that it was running at less than 50% capacity. This prepares us for a higher unit cost, or cost per ton, than as if we were running at 75 —80% of full load.

Item #1—is the direct labor paid, which should be defined clearly so as to include all those employees who are so considered. We may call firemen direct labor and ash wheelers indirect, or both may be termed indirect, and only the loaders and strippers called direct. It is of little importance, as we have said, as long as we know what the classifications are and can locate each man's time, unless we are to compare our costs with some other mill, in which case the classification must be identical in all mills.

In sequence follow the various items of indirect labor, ending in a total labor figure. (Line 6)

Then from our stores reports and expenses vouchers come items 7 to 25 with as many of the items reported as are used in the process. This being a universal sheet, we would expect to see acid and inhibitors reported on the cleaning

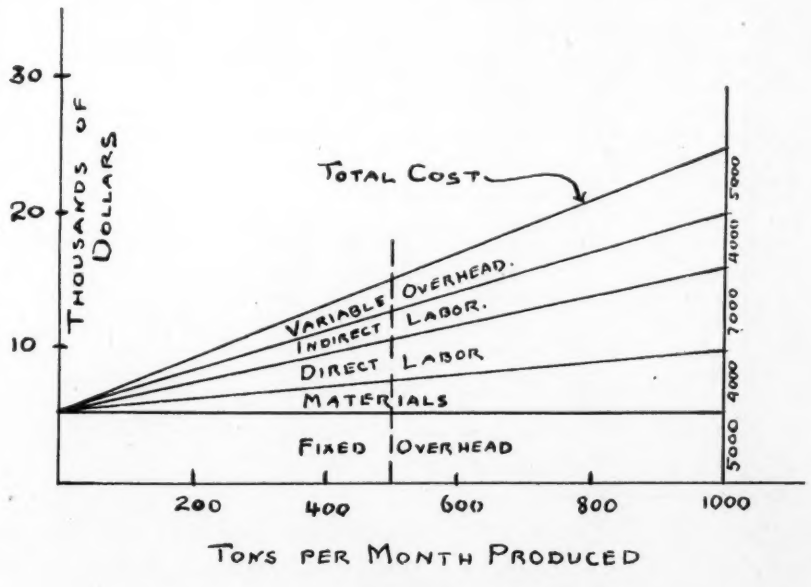

Fig 1.

sheet, but not on that for annealing, and so on.

Repairs and maintenance are then reported separately for purposes of emphasis and control and then comes in item 31 the lump sum charge for "plant burden." This is something that the foreman cannot control, as it includes salaries of general company officials, general accounting departments, and, in short, the general expenses of running the business. For an auditor or controller, these expenses may all be detailed and opened to analysis, but the foreman must simply take it as given him, and; of course, cannot be held responsible for its amount.

Item 22, Department Burden, is the share of the plant salaries, taxes, insurance, etc. to be borne by the department. This figure also is out of the control of the foreman, but partially under the supervision and responsibility of the Plant Superintendent.

Line 33 gives us our total cost which is then distributed for the purpose of making up further cost sheets as shown in lines 35 to 42. These distributions cover shipments to any departments which receive annealed wire, and will appear on their respective cost sheets as part of the cost of the finished wire.

In the column headed "Amount" is recorded the actual money in dollars and cents spent for each item and then under "cost per ton" we get the real significant figures with which we have to work, and which show us what the operation actually cost.

If, however, we have only the actual costs reported, we can tell only from comparisons with the costs of former months whether our current operation has been better or worse. This takes time, and it is hard to average a lot of figures in one's head so we now prepare the "standard" column, which tells us what each item **ought** to cost under normal conditions, and we thus provide a direct means for seeing just how good or how bad our performance really has been.

The preparation of a set of standards is no easy matter. It is usually done by averaging actual costs over a period of months at normal productions, and then setting more or less arbitrarily a figure for each item, the actual value of which is finally determined by the exercise of a certain amount of common sense. If conditions are known to have been out of line, during the period observed, the standard or expected cost is influenced accordingly.

Now, by filling out the variation column—usually done in black for under standards, and red for over—we add up the differences and see by how much we either failed to meet our expected costs or succeeded in beating them item by item. Furthermore, we can see in just what items or classifications we were deficient, and single them out for further study and correction.

On the sheet shown, we were under standards by $.057 per ton or 1.1%. This would be considered very good practice, but we would probably not be satisfied with it as some items are over standard and would look first into our fuel costs, as they showed five cents a ton high. If the standard is properly set we would try to reduce this item the next month, and thus come nearer to ten cents under standard.

We are five cents over on plant burden. If our production is up to normal, we can only pass this by, and hope that the management will either reduce expenses or change the standard, or, if we have enough business, we will try to increase the production of the department suffciently to meet the conditions set.

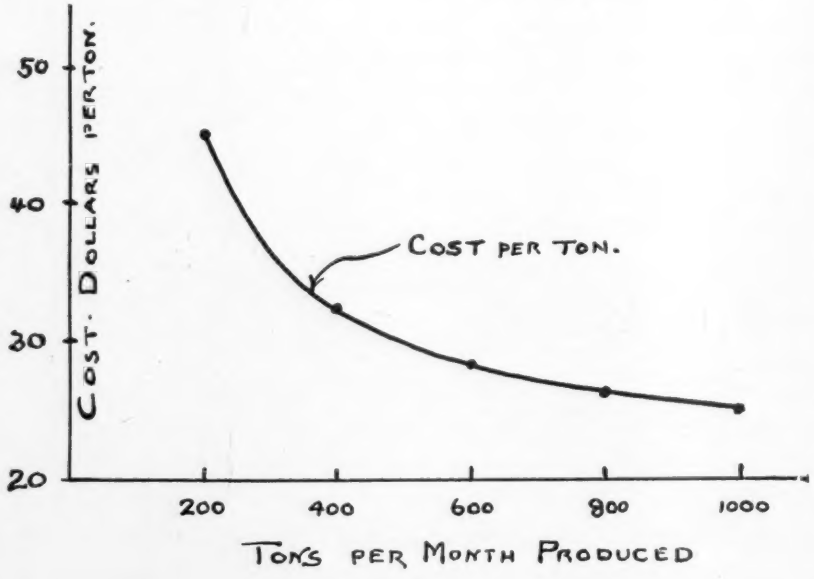

Fig 2

Advantages of the Standard Cost System

IF we have every item of our costs properly analyzed, and know just what each operation ought to cost, we are like a golfer trying to play a course in par or better. The duffer will miss a few shots now and then and his score will suffer, but the good player will meet par more often, and sometimes get a birdie or an eagle. Constant attention to his game will make the variations less and less, until finally he meets par consistently, and month by month turns in a score card with only an occasional red figure. I like to think of this business as a game with a total possible score to meet or beat both for production and costs. There is just as much satisfaction in turning in a good card on the cost links as there is in playing an 83 course in 81, and also usually a considerably greater financial return.

Standard Costs As a Basis For Planning

IF we have our standard costs properly established, and have been told just how much our fixed charges are going to be, and how much the labor, materials, supplies and incidental expenses should be per pound or ton produced under normal conditions, we at once have a means of predicting what our expenses ought to be with any given amount of production. If we chart this condition, we get something like figure I—showing Manufacturing cost at various rates of Products.

Influence of Fixed Expenses on Ton Cost

"FIXED" expenses are those which do not fluctuate with increases or decreases in production. It is usually impossible for the foreman to analyze these without recourse to the accounting department, but they can be easily determined. The other expenses should vary with different rates of production.

Our costs, which of course are taken at random, may show as follows for a normal capacity of 1000 tons a month—

Materials	$4,000.
Fixed Expense	5,000.
Direct Labor	7,000.
Indirect Labor	4,000.
Variable Overhead	5,000.
	$25,000.

✦ ✦ ✦

If our production should be cut to 500 tons a month by reason of business conditions, we can immediately see that we should spend only one half of the variable amounts that we did for 1000 tons or

Materials	$2,000.
Fixed Expense	5,000.
Direct Labor	3,500.
Indirect Labor	2,000.
Variable Overhead	2,500.
	$15,000.

This means that the expenses for which the foreman is responsible should be cut in two, and it is up to him to watch his payroll, his stores requisitions and other items so as to be sure that this amount is not exceeded. In times of stress, as well as in times of greatest production, the foreman should have at least a weekly check-up of these factors so that he may be sure that his quotas are not being exceeded. The accounting department, if properly organized, can furnish the figures regularly without any difficulty.

The actual cost of production for 500 tons a month then would be the variable expenses of $10,000. plus the fixed charges, over which the foreman has no control, of $5,000. This means that with a standard cost of $25.00 a ton based on normal conditions, the reduction of tonnage by one-half has raised the actual cost to $30.00 a ton, and still the foreman is playing an absolutely par game as far as the costs under his control are concerned. The only time the management can criticize him is when the costs that are variable and that are under his control exceed the standards.

Decreased Production Increases Cost Per Ton

IT is interesting, by the way, to see the effect of decreasing production on costs per ton. Using the amounts shown in figure 1, we find the following—

% Production	Cost per Ton
100	$25.00
80	26.25
60	28.30
40	32.50
20	45.00

or to chart this (figure 2)—This explains why it costs so much more to run a plant in dull times, and why the profits are then so much less in proportion.

Summary

WE have tried to convey the impression in this paper that "costs" are nothing of which we should be particular afraid, of which we cannot readily understand and analyze. We have not been very technical, nor did we intend to be. Cost analysis is after all only common sense in figures applied in a logical manner. The accounting department should not be regarded as an espionage system, but as a tool for the foreman and superintendent to use in his endeavors to keep his costs where they ought to be.

Volumes have been written about standard costs and their application, but if we merely regard them as showing what an operation or a product ought to cost as compared with what it actually did cost, and as a means whereby we cannot only measure our past performance the same as we check against par on a golf course, and find out where we are wrong, but also can lay out our course in advance, the whole thing loses its formidability, and we can use it to the fullest advantage.

Bookkeeping, accounting, and cost analysis are only logical, common sense methods of recording figures so as to show how efficiently we use our materials and man power, and in spite of the mystery and macaronics with which many accountants have surrounded their work in the past, there is nothing in any properly devised mill accounting system that anyone cannot understand and use with a little study—and most important of all—with a little common sense.

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Useful Information About Lead

THIS book tells concisely the story of lead and its principal uses and should be of interest and practical value to every present or prospective user of lead and the multitudinous products derived from it. Short chapters are devoted to the major industries consuming lead and the part lead plays in them including Physical properties of Lead, Lead Alloys, Chemical Corrosion Resistance of Lead, Lead Compounds. The table of properties of lead is probably the most complete and up to date ever published, including mechanical, thermal, electrical, optical and other constants. The chapter on lead compounds describes the manufacture and use of the more important varieties and has appended a table of many others, their characteristics, manufacture and uses. Many corrosive chemicals handled in lead equipment are listed and typical formulae of important classes of alloys are given. Published by Lead Industries Association, 420 Lexington Avenue, New York.

GALVANIZING

By W. H. Spowers, Jr.
Consulting Galvanizing Engineer

A paper presented at the annual meeting of the Wire Association, outlining the latest improvements in galvanizing methods and presenting some new thoughts on this subject.

SINCE last speaking to you a year ago in Buffalo most definite progress has been made along three lines in the galvanizing field, two of which I spoke of at that time.

You will remember that I gave you the technique for the neutral flux process and in this connection I want to tell you a little story.

The chief engineer of a well known wire plant happened to be present at that Buffalo meeting. Evidently my remarks on this subject impressed him for he made notes and after the meeting asked me some further questions in regard to this technique. Some time later, two or three months perhaps, I received a letter from him stating that he had found that this technique reduced their dross consumption 50%. This company is now entirely revamping their galvanizing department and we are putting in modern and deep fired equipment in each branch of the work with definite indications that the entire expense involved will be recovered in savings within a year's operation.

So much for the neutral fluxing technique and I will not rehearse this further.

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You will remember also that I said some things to you in regard to the advisibility of properly firing galvanizing equipment by the use of deep installations with correct placement for the heat. One such installation in the past year has reduced dross loss from 25% to 9% with the assistance of the neutral flux technique. And you probably have seen some of the publicity which has been given to one of my recent installations in Canada based on this principle. This kettle was started January 8th, and was first drossed on April 18th delivering 1020# of dross. It was drossed the second time on May 23rd, delivering 860# of dross and has not been drossed since. 175,822# of spelter have been consumed in five months with 1880# of dross. This is a loss of slightly over 1% in five months' operation.

A companion installation operated on the same basis but of the shallow under-fired type operated in the same five months with a yield of 21% dross.

Boiled down to hard dollars this modern setting has saved in five months in dross alone $1843.68. In this installation the full ntutral flux technique is in operation with a very delightfully constant heat application.

The quality of the coating coming from these deep fired installations is very superior and our experiments so far on fence and telephone wire have yielded remarkably fine products.

W. H. SPOWERS, JR.
Consulting Engineer on Galvanizing
Member Wire Association

Tight Bonding

THE third progressive step to which I refer is not really in the galvanizing department but rather at the open hearth. Some very interestinf work has been done here in the matter of tight bonds by using the proper technique in killing the steel at this point. In the same manner in which I gave you the technique for the neutral flux procedure last year, I will this year summarize this technique with the statement:—

Tight bonding may be definitely advanced by producing steel at the open hearth which has been fully silicon killed and with the elimination of any aluminum whatever.

You will note here that I said fully silicon killed. This does not mean semi-killed. The killing must be accomplishhed by the use of silicon alone and without the addition of any aluminum.

Now, so much for these distinct steps in the way of progress accomplished and I wish at this time to say something to you in regard to the standardization of technique in the galvanizing process.

In the past year I have reviewed several of the largest plants in this country and Canada and have been more than ever impressed with the lack of systematic control of the steps in galvanizing wire. I doubt if any operation in the entire plant could be expected for a moment to succeed with anything like the rule of thumb procedure which exists in some of these galvanizing operations.

Old Fashioned Hot Galvanizing Technique

LET us follow step by step the old fashioned technique in hot galvanizing wire. In the first place we have wire presented to the pickling department which in most cases is correct to analysis but to which little attention has been paid in regard to its structural characteristics. This must be remedied at the open hearth, if tight bonds are to result. The wire is then presented to a pickling bath. In the old style practice there is no accommodation as to strength of acid, to speed of wire, there is no adjustment as to length of immersion to speed or size of wire and in some cases no adjustment of either to the condition of the wire. In almost all instances of old style practice little or no attention is paid to iron content in this bath.

In most cases temperature of this pickle is assumed by rule of thumb.

Each one of these conditions tends to a varying result in this pickling procedure and is shy of any excuse whatsoever except that the result seems to be good enough.

In this old style technique the wire then passes to another tub of hydrochloric of lesser strength. In many cases the second is not even present and the pickling bath is continuously operated to clean and to flux. This second bath, if present, rapidly becomes high in iron because of the carrying over of iron salts resulting from the pickling action and little attention, if any, is ever paid to it. The wire then passes directly into a galvanizing pan.

By this technique the pan is being heated from the bottom.

✦ ✦ ✦

Let us take such an under-fired installation and give it a mental X-ray and see what happens. The dross formed from the iron salts being carried over from the hydrochloric, the dross from the side of the kettle and from the wire itself is all endeavoring to settle peacably to the bottom of this kettle. In its endeavor to do so, it faces the resistance of the heat which is being forced through from the bottom which throws it upward and holds a high percentage of it in suspension. This dross in suspension is placed upon the work and is extremely, may we call it, cancerous in its action. Dross held in suspension or boiling dross has a definite tendency to manufacture dross in its own behalf because it is repeatedly contaminating the otherwise nearly iron-free spelter at the top of the kettle.

I submit that uniformity of technique cannot exist if this varying situation is present. I recently stood beside one of these pans and asked the potman how he controlled his pan. After relating his method of cooling by the addition of cold spelter he said "I raise the temperature to 900° at the end of the week in order to maintain heat through the dross".

Now such a kettle we will assume is drossed on Saturday and has full opportunity to settle on Sunday and we start with what we may consider a clean pan on Monday. We will assume then that this spelter contains approximately .02 in iron. Examination of the spelter on 24 hour periods throughout the week until next drossed will show variations from this point to as high as .19 in iron and the jump on the first day will sometimes reach .114.

In the case of iron-free zinc this may be increased to a point as high as .286 before the week is out. Now, it may be readily seen in the light of standardized technique that we galvanize here under varying conditions throughout the length of the entire week and it is not possible, I submit, to obtain a uniform result with such non-uniformity in procedure.

Modern Hot Galvanizing Technique

IT is remarkable and very delightful that the remedies for this situation react to the profitable side of the ledger. Constancy in the acid technique means saving in acid. A very interesting and very conclusive test has recently been run on two galvanizing frames, one using the old style hydrochloric flux and the other using the wash-zinc-chloride technique, held to constancy. This test so far has covered a period of 13 weeks and a tonnage on each frame of approximately 5,000 tons. In this comparative run nothing was changed except the flux technique. The old style under-fired pans were used and the quantity and quality of wire were identical. There not only was a very constant saving in acid and skimmings but a very satisfactory saving in dross loss. This, without any assistance whatever in kettle manipulation and under conditions in which it was difficult to forecast any material saving.

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Again, when we take into consideration correcting the matter of boiling dross we are confronted with definite benefits. We eliminate first off the ruination in short time of the kettle installation. We can effect a considerable saving in fuel even when manufactured gas or electricity is substituted for coal and also in calling the count of ten on the boiling dross we eliminate this source of dross manufacture.

And last but not least to my mind, we produce a quality of finished product and uniformity of finished product of great benefit to the industry.

Heavier Coatings Under Consideration

Now, I have one more thing which I wish to bring to your attention. I recently had occasion to talk to a representative of a large consumer of galvanized wire and I am given to understand that the matter of two ounce coatings or more is being given consideration in a very definite manner and because I know that you will have to meet such specifications during the coming year I want to tell you those things that must be borne in mind in this regard.

You know, as a matter of fact, there are very few operators who really have a clear idea of the fundamental reasons for the adhesion of zinc to steel and I think a true picture of this process would be

(*Please turn to page 372*)

Wire In Every Day Life

By William A. Bennett

Superintendent, Goddard Works,
Wickwire Spencer Steel Co., Worcester, Mass.

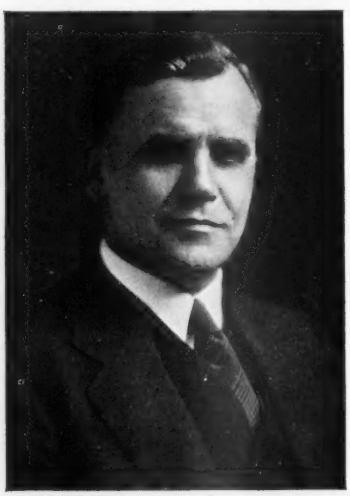
An address delivered over the radio through the courtesy of Station WTAM of Cleveland, Ohio, during the Wire Association meeting. This address outlines briefly but fully the importance of wire in our everyday life.

I regret that the time allotted for this talk will not permit even a brief outline of the history of wire making. While its origin has been pretty much shrouded in mystery there is little doubt but that it was an art hundreds of years B. C. Biblical references to wire (probably fashioned from the more precious metals) is made even in the Book of Exodus. Records and references to wire making can be more or less closely traced down through the ages, but we must pass swiftly over the chasm of years to its inception in this Country.

There were feeble and spasmodic attempts at various times and places to make wire here as early as the latter part of the 18th Century. But Central Massachusetts became the real cradle of this infant industry more than a century ago, which has since grown to be an industrial giant, nation wide in scope, affording employment to tens of thousands and contributing materially to the advancement of science, and the daily luxuries which are so commonplace in our lives.

Did it ever occur to you that the monarchs of the old world with all their pomp and power never knew the thrill of using the very ordinary conveniences which we enjoy, many of which are wholly or partly made of wire? It is difficult to conjure how wire and articles made from wire have influenced our civilization and national progress. How our own George Washington would have enjoyed the warming rays of an electric heater at Valley Forge and who can say that even the results at Waterloo might not have been different if Napoleon could have resorted to the use of a field telephone.

And to the women folks, the wire fraternity must pay its tribute for the part they have had in the advancement of this great industry. Every changing style from the era of the hoop skirt, (and during this hoop skirt period it is interesting to note the mills in one community alone produced more than 1500 tons annually of this commodity). The bustles and bonnets, dress stays, hair pins, hooks and eyes, bobby pins to say nothing of the myriads of ornaments for dress and hat which have all influenced wire production and tonnage to an incalculable degree. Wire has become more than ever an indispensable element in our modern every day life.



WILLIAM A. BENNETT

If you doubt this statement let us follow the routine of an average individual just for a day. As the first rays of the morning sun filter through the wire screen of his window and he is enjoying the sleep of the honest toiler, and we are all toilers either of brain or brawn, he may be suddenly awakened by the rude and impulsive call of the alarm clock, and what is that alarm clock, a case made of flat wire, nickel plated, containing an assembly of wheels and gears stamped from flat wire, all pinioned and driven by flat wire springs. Even the bell may be a piece of flat wire pressed into shape, add to these the hands stamped from flat wire, and all together these make up the clock construction.

The bed clothes thrown back, have all been made of cotton and wool, carded with wire and woven on machines large made of wire. In going to the window he finds the shade is held in place by small flat wire brackets and regulated by a coiled spring concealed in the roller. He walks across the floor fastened down with wire nails, every door he opens swings on hinges equipped with wire pins or pintles and every lock is operated with wire springs.

As he prepares for his morning bath he turns the faucets made of wire stems and even the soap he uses may have been cut with wire saws at the frames. His bath completed he dries himself with towels woven on a Jacquard loom, a marvelous collection of wire needles and drop wires.

Every article of clothing he dons has been manufactured through the use of wire and as he fastens

(*Please turn to page 374*)

Automatic Combustion Control Systems for Wire Furnaces

By F. Aschner and H. Mayer-Witten*

Part II -- Sec. I

Automatic furnace control is of special significance in the manufacture of wire, since the economy of the process and the quality of the production largely depends upon the management of the furnaces and ovens.

The present articles deal with the regulating systems developed in Germany; Part I, covering the types of regulators used and Part II, showing the methods of operation and the results of service in existing installations.

The method for regulating electric stoves as employed by Messrs. W. C. Heräus, Hanau, presents very interesting features and differs from the temperature sensitive devices which have been mentioned up to the present. (See Figs. 11 and 12a and b).

The operation of the regulator depends on the thermo-influenced alteration of the electric resistance of the main heating winding. The regulator is therefore only applicable for heating elements with large temperature coefficients, such as molybdenum, nickel, etc. As shown in Fig. 11, it comprises a current relay and a voltage relay, 1 and 2, the pendulum P, the mercury time switch Z, the variable resistance W and the switch S. When the stove is switched in, the current which flows through the heating winding is large, and the pendulum P is therefore strongly attracted by the current coil 1, and the contact K remains open. As the temperature in the oven increases, the current falls because the resistance of the heating winding augments. As a consequence, the magnetic attraction of the voltage coil 2 overcomes that of the current coil 1, the pendulum is drawn over, the contact K closed and the lamp L switched in. The gas which fills the switch expands due to the heating and interrupts the mercury column, whereupon the heating circuit is switched off.

When the heating circuit is interrupted, both coils become dead and the pendulum, on returning to the rest position, again opens the contact K. The time switch Z prevents the mercury flowing back immediately, and thus introduces some cooling down of the stove or heating winding. When the heating current is again switched in, the attractive force of the current coil again predominates until the nominal temperature is attained. The pendulum continues its action continuously and renders possible a very fine regulation of the temperature. The setting of the nominal temperature results by way of the variable resistance W in the circuit of the voltage coil 2; this resistance enables the magnetic attraction of this coil to be regulated within wide limits.

In electrically controlled plants with large heat capacity, a retarded time relay is used in order to reduce oscillations of the stove temperature.

After a regulating impulse has occured, the function of such an "oscillation damper" holds

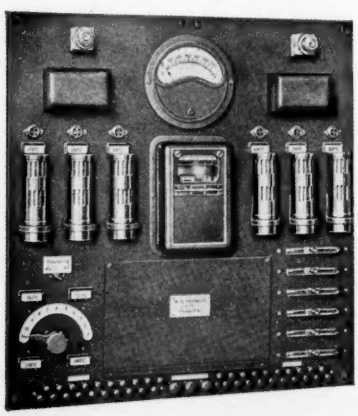


Fig. 12. Heraeus temperature regulator: a. Entire metallation for regulating 6 furnaces each for a different adjustable nominal temperature.

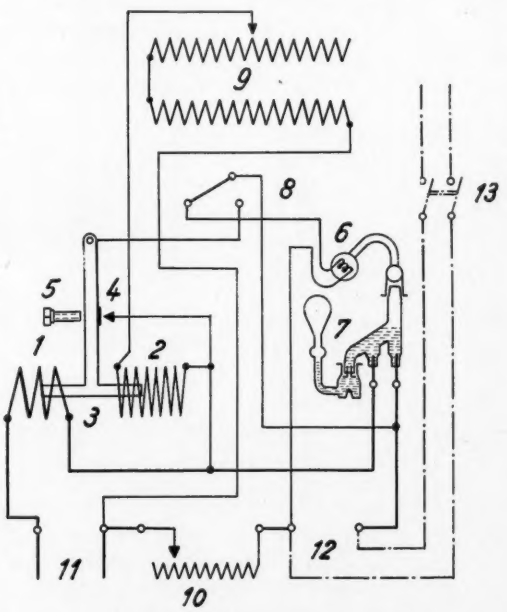
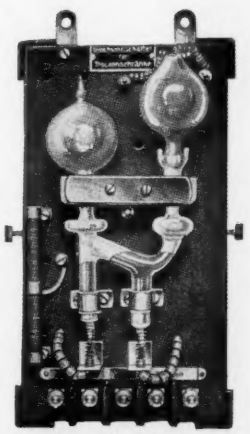


Fig. 11. Diagram of the Heraeus temperature regulator: 1. Current Coil. 2. Voltage Coil. 3. Pendulum. 4. Contact. 5. Adjusting screw. 6. Heating wire. 7. Mercury switch piston with damping disc. 8. Switch. 9. Disc resistance. 10. Regulator resistance. 11. Connection to furnace. 12. Connection to net work. 13. Main switch.



b. Mercury switch piston.

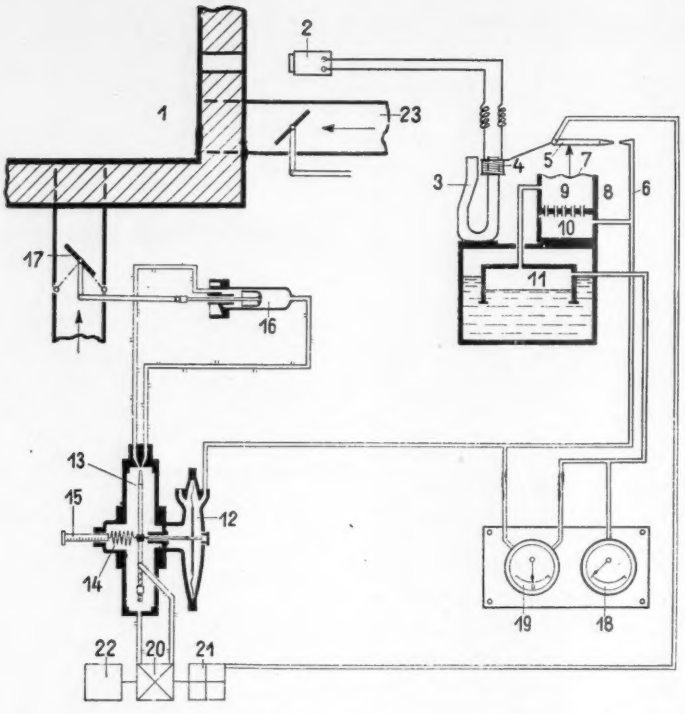


Fig. 13. Diagrammatic representation of the Askania temperature differential quotient system: 1. Furnace. 2. Radiation pyrometer. 3. Solenoid. 4. Coil. 5. Jet tube. 6. Nozzle with pipe line. 7. Diaphragm. 8. Capilliary cartridge. 9. Diaphragm chamber. 10. Chamber. 11. Compressed air container. 12. Diaphragm system. 13. Radiation tube. 14. Spring. 15. Adjusting disc. 16. Control cylinder. 17. Baffle. 18. Pressure gauge. 19. Differential pressure gauge. 20. Oil Pump. 22. Driving motor. 21. Blower. 23. Main for combustion air.

back the next regulating impulse for a period equal to that occupied by the fluctuations corresponding to the heat capacity of the furnace. If the stove temperature falls to the nominal value before the expiry of the normal retardation, the oscillation damper again switches over to normal regulation.

As previously mentioned, each time relay represents a damping which, in turn, takes place at expense of the sensitivity of the regulator. A more effective exclusion of the oscillations due to the heat capacity and consequently, increased accuracy is obtained by the differential quotient (or gradient) regulation. In this method it is not the absolute value of the temperature, but the speed at which the alteration of the temperature takes place, i. e. dT—dt which sets up the impulse.

This method has been applied for instance in such a manner that two thermo-couples with different heat capacities are connected in opposition, but in series with a third thermo-couple which serves for measuring the regulating temperature. When a temperature increase occurs, one of the solder joints warms more slowly than the other, in view of the different heat capacity, hence a "difference" thermal force which is proportional to dT—dt is obtained. The construction of the couple and the satisfactory insulation of the cold solder joint presents difficulties which have a special bearing on the accuracy of this method. Attempts are frequently made to obviate these difficulties by using the potentiometric measuring method with which one of the thermo-forces is replaced by a constant current generated by a normal element.

The difficulties previously mentioned, are avoided by the Askania method which is also a differential quotient process, as here the speed at which the stove temperature alters is not used directly but an auxiliary regulation device is included, which transforms electrical current into an air current (Fig. 13).

The electrical measuring impulse which is obtained by way of a thermo-couple or an optical pyrometer is converted into a proportional air pressure, which is in turn transmitted to a jet-pipe system as previously described. Fig. 13 shows the method of operation. A completely balanced system swings around the pivot 24 of the current-potential transformer, one side of this system carrying the coil 4 which is transversed by the thermo-current and on the other side is the jet-pipe 5 which is exposed to the air pressure in the chamber 9 by way of the diaphragm 7. An air current flows through the jet pipe and impinges on the opposite nozzle according to the position of the jet pipe. Increasing thermo force (temperature) corresponds to a movement of the coil 4 which is damped by the magnet 3; thereby, the air from the jet pipe impinges more strongly on the nozzle and the air pressure in the chamber 9 increases until its magnitude approximately corresponds to the thermal force. A definite increase in the air pressure per second represents a definite volume of air flowing into the chamber per second. This quantity of air per second consequently represents a measure for the alteration of the air pressure within the time unit, and therefore it is also a measure of temperature alteration in this interval, i. e., to the speed of alteration. A resistance to the flow (9 and 10) enables the air volume to be determined. The pressure difference resulting is proportional to the air current and is transmitted by a simple jet-pipe regulator 12 which takes over the control of the heat supply by way of the power cylinder 16 and the regulating device 17. Stable regulation without irregularities is thus obtained.

All of the previously described devices which are sensitive to temperature changes can be utilised with electrically heated stoves. Control of the heat supply is achieved in a simple way by interrupting the circuit or by adjusting the regulating resistances. Diagrams of connections suitable for this purpose will be described in a subsequent article.

Regulation of the Volume of Combustion Air

Excluding electrically heated wire furnaces in addition to regulation of the fuel supply, the greatest attention must also be directed to the proportion of combustion air supplied in order to ensure the fuel being favorably utilized and to obtain a uniform temperature for the stove. These ends are achieved by the Askania mixture regulator, an example of which is illustrated in Fig. 14.

The Askania regulator is fitted with two measuring systems 9 and 10 which are influenced by the quantity of the fuel and the volume of the air. The received impulses are transmitted to the jet-pipe which takes over the control of the air volume by way of the power cylinder 16 and the regulating damper 3. The ratio between the quantity of the fuel and the air volume can be adjusted within a wide range by the slide 19.

The special ratio regulation is superfluous with such gas and oil burners, which automatically draw in the air volume to the fuel supply after the burner has once been adjusted.

Regulation of the Pressure Inside the Stove

Automatic regulation of the pressure inside the stove by control of the flue gas damper is particularly recommendable with furnaces for heating the raw material of the rolling mills, as in this case an appreciable disturbance of the equilibrium of the heating process arises from the frequent opening of the stove doors. It is general practice to cut off the heating when charging and emptying the stove and a considerable loss of heat occurs unless the flue gas damper is closed at such times. Almost without exception, this is omitted in hand-regulated ingot stoves. If the pressure in the combustion chamber is held constant, equilibrium is ensured for the stove because the pressure provokes the regulating impulse for the automatic control of the flue gas damper. As a simple example of the construction of such a regulator, reference is again made to the Askania jet pipe regulator system which is illustrated in Fig. 15. The pressure from the combustion chamber is applied to the diaphragm and equilibrium is established by means of a counter-spring. The height of the pressure in the combustion chamber can be set to the desired value by adjusting the initial tension on the spring.

A subsequent article will deal with furnaces equipped with the regulating devices described, and further, mention will be made to results obtained from installations fitted with automatic regulators.

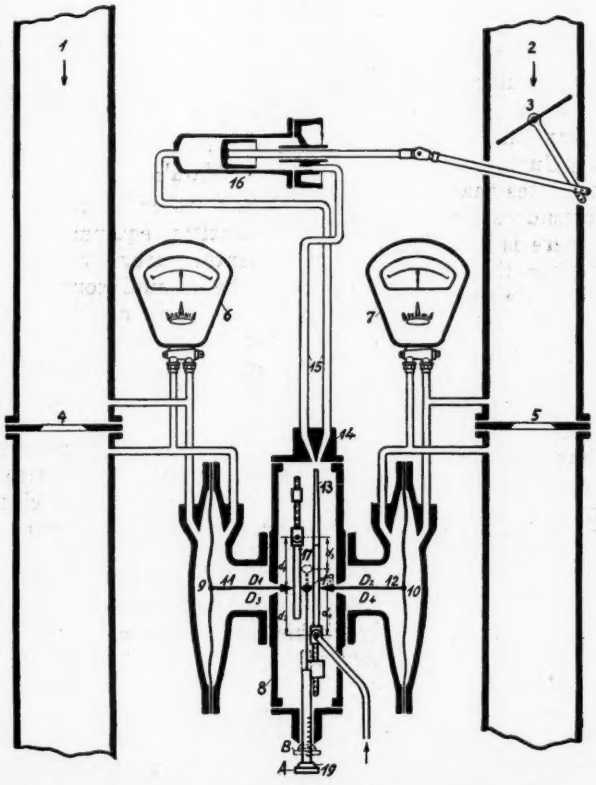


Fig. 14. Diagram of connections for the AEG Askania ratio-regulator: 1. Gas main for Gas I. 2. Gas main for Gas II. 3. Throttle valve. 4-5. Baffle plates. 6-7. Indicating instruments for quantities of gas. 9-10. Diaphragms. 11-12. Pressure pins. 13. Jet pipe. 14. Distributor. 15. Operating ducts. 16. Control cylinder. 17. Intermediate contact piece. 18. Fulcrum. 19. Adjusting valve.

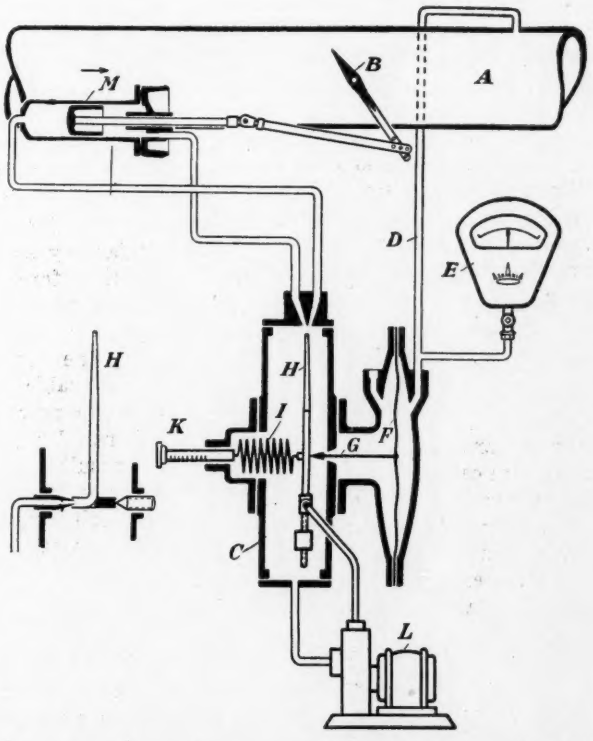


Fig. 15. AEG-Askania pressure regulator: A. Pressure main. B. Throttle flap. C. Mechanism of regulator. D. Impulse line. E. Indicator. F. Leather diaphragm. G. Pressure pin. H. Jet tube. J. Adjusting spring. K. Adjusting disc. L. Oil pump mechanism. M. Control cylinder.

'Round the World With the Wire Industry

German Wire News

THE German wire cartel has absorbed more outsiders with the effect that the capacity of the outsiders is now only some 0.5-0.7% of the total German wire production.

✦ ✦ ✦

THE high import tariff on wire netting in America has virtually killed the trade during the past two months, but now owing to the existing great difference in prices, American importers are again asking for quotations from the Pacific Coast and a few orders have been placed. The discrimination of the American Tariff between wire netting of hexagonal mesh made of galvanized wires and galvanized after make, is causing imports to be made of netting made of galvanized wire, as the import tariff is lower.

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EXPORTERS of wire machinery have received inquiries and business from South Africa, China, Japan, Australia, New Zealand and the Near East, but not from Latin America, showing that the indigenous wire industry in these markets is again reviving. Wire nail machinery of the latest design was in the foreground of interest. The demand for wire drawing units is comparatively poor.

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THE demand for wire and wire products is getting rather satisfactory. The prices are moving upwards and the Belgo/German wire cartel seems now to be in full control of the market. The demand is coming principally from Latin America and South Africa, but it is expected that very soon also the Far Eastern markets will start to buy. The market for wire netting has not yet been affected by the general improvement and prices remain as low as 88% discount off the standard list. The demand for wire ropes is slightly better.

THE principal German makers of wire mesh have agreed to sell wire mesh for export at uniform prices: 12 mesh at 20/, 14 mesh at 21/6, 16 at s 24/6 and 20 at 27/6 per roll at 3' x 100', 6 rolls in a case. These prices are for soft quality, for hard (American) the prices are up to 10% higher. The demand goes however more for soft, than for hard quality.

✦ ✦ ✦

AMERICA is importing less ordinary wire rods, but more special wire rods. Exports of wire rods from the Continent to America included formerly ¾ of all quantities shipped of ordinary Thomas steel wire rods, but now hardly more than ⅓ is of this type, the rest being special grades, such as charcoal steel wire rods, high carbon wire rods and other wire rods of high tensile strength for wire rope manufacture etc.

✦ ✦ ✦

British Cable Plant Closed

IN the course of a circular dealing with the question of obsolete and redundant plant, the board of the India Rubber, Gutta Percha & Telegraph Works states that after most careful consideration, it is of opinion that there is now no necessity for retaining the Burton factory as a separate unit. It has, therefore, decided to close it and to transfer the work and necessary equipment to Silvertown, the location of the firm's largest cable factory. Preparations are now in hand, and when the transfer has been completed, the result will greatly facilitate and expedite the firm's output, besides effecting a very substantial saving to the undertaking.

✦ ✦ ✦

African Nickel Discovery

TANGANYIKA Government has granted prospecting rights over an area of 1,300 square miles near Dodoma where an extensive discovery of nickel is reported. American and Canadian interests are sending representatives to examine the properties where they hope to acquire options.

✦ ✦ ✦

St. John Branch for Corporate Steel Products, Ltd.

CORPORATE Steel Products, Ltd., Montreal, will establish a branch at St. John for the manufacture and distribution of the company's products in the Maritime Provinces. The new industry will be located in the former British Canadian Packing Company's plant at East St. John.

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Nail Tariff for India

THE (Indian) Tariff Board is investigating the question of granting protection to the wire and nail industry of India. The investigation is being made at the request of the Indian Cable Company, Ltd., whose factory is at Jamshedpur. Most imports of these products now come from the United Kingdom.

✦ ✦ ✦

Heated Wires Render Air Flow Visible

A LARGE number of machines and scientific equipment of an experimental nature were exhibited at the annual conversazione of the Institute of Civil Engineers, recently held in London. Among them was a new apparatus for rendering air flow visible by means of heated wires. In this, the flow pattern round a body mounted in an air stream is rendered visible by placing a grid of electrically heated platinum wires in front of the body, so that thin bands of hot air are produced. These bands, although not directly visible, cast shadows on an illuminated screen, so that the flow can be observed between the hot wires or shadowgraphs may be observed on sensitized paper. These shadow bands are visible at high air speeds, so that the flow can be examined at reasonably high Reynold's numbers.

A Review of Recent Wire Patents

No. 1,809,023, STRANDED BELT, Patented June 9, 1931, by Edward A. Conner, of Stratford, Connecticut, Assignor to American Cable Company, Inc., a Corporation of Delaware. Particularly, this belt is adapted for use as a leader for introducing brake linings into treatment tanks, and is constructed of a number of stranded wire members, disposed in parallel relation and a number of transversely disposed wire clips clamped in spaced relation upon the wire members, the spirally twisted wire components of the members being imbedded by compression in the clips.

* * *

No. 1,808,193, PREPARATION OF FLEXIBLE CABLES, Patented June 2, 1931, by Hartwell W. Webb, of Flint, Michigan, Assignor to A. C. Spark Plug Company, of Flint, Michigan, a Company of Michigan. Particularly, this invention relates to a flexible cable, such as is used in driving speedometers, and while a multi-strand wire is employed, the ends of the cable are square and welded together.

* * *

No. 1,809,863, APPARATUS FOR AND METHOD OF MAKING WIRE GLASS, Patented June 16, 1931, by Elisha W. Paxton, of Washington, Pennsylvania, Assignor to Highland Western Glass Company, of Washington, Pennsylvania, a Corporation of Delaware. Objects of the invention are the provision of a wire setting device which also functions to control the flow of glass to the rill pass, and which is constructed to prevent deterioration of the glass from contact with certain of its parts, and also the provision of means for maintaining a reduction or non-oxidizing atmosphere in the region where the wire come into contact with the glass.

* * *

Reissue No. 18,107, STRUCTURAL UNIT, Reissued June 23, 1931, to Dewey H. Bitney, of Albion, Michigan, Assignor to Union Steel Products Company, of Albion, Michigan. This device is adapted as a bolster or support for the reenforcing bars in concrete structures. It is constructed of sections of bent wire, forming a rod section and spaced feet attached thereto.

* * *

No. 1,815,706, METHOD OF IMPREGNATING CABLES, Patented July 21, 1931, by William A. Del Mar, of Greenwich, Connecticut, Assignor to Habirshaw Cable & Wire Corporation, of New York, N. Y., a Corporation of New York.

According to the method the fibrous or absorbent insulation is contacted and the surrounding layer or layers of material, which ordinarily prevent or at least impede the passage of the impregnating material to the fibrous material, is expanded thereby permitting entrance of the impregnating material into contact with the insulating material sought to be impregnated.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 551 Fifth Avenue, New York.

No. 1,808,816, SCREW THREAD TESTING DEVICE, Patented June 9, 1931, by Charles G. Johnson, of Hartford, Connecticut, Assignor to Pratt & Whitney Company, of Hartford, Connecticut, a Corporation of New Jersey. Specifically, the screw thread engaging means of this device are annular elements, certain of which have a periphery shaped to the form of the thread being tested and others of which are shaped to accurately engage the thread for lead testing.

* * *

No. 1,812,147 and 1,812,148, MEANS AND METHOD FOR PRODUCING CURVED-THREADED NUTS, Patented June 30, 1931, by Elis Helin, of Stockholm, Sweden, Assignor to Carl Kindstrom, of Stockholm, Sweden. The inventor provides a tap for cutting nuts for curve-threaded bolts, the tap being provided with cutting teeth extending over a portion having a wider base and a narrower top with its greatest core diameter at the base.

* * *

No. 1,811,081, COMPOSITE METALLIC FABRIC, Patented June 23, 1931, by Ralf L. Hartwell, of Orange, New Jersey, Assignor to Metal Textile Corporation, of West Orange, New Jersey, a Corporation of Rhode Island. This invention covers a wire mesh fabric so constructed that when it is bent or deformed into the shapes desired, it will remain in such shapes when the deforming means are removed. Another object is to provide a metallic fabric which will not fray out at the side edges even when a selvage edge is not employed.

* * *

No. 1,814,102, HIGH TENSION ELECTRIC CABLE WITH PAPER INSULATION, Patented July 14, 1931, by Max Weiset, of Tempelhof, near Berlin, Germany.

A conducting layer is arranged on the hollow chambered conductor provided, which layer consists of a layer of porous and absorptive caacity, so that the layer is permeable by the impregnating substance. This layer consists of a paper, the pulp of which received a finely divided conducting material, such as metal powder, graphite and the like.

* * *

No. 1,814,384. LEAD COVERED SUBMARINE CABLES, Patented July 14, 1931, by Ferdinand Hanff, of Berlin-Charlottenburg, Germbany, Assignor to Siemensschuckertwerke Aktiengesellschaft, of Berlin-Siemensstadt, Germany, a Corporation of Germany.

The assembly includes a supporting tubular shell underneath the lead cover, the shell consisting of wires of higher compressive strength and wires of lower compressive strength, the first contacting with one another and being provided with adjoining recesses, the latter being located in the recesses.

No. 1,813,993, MACHINE FOR AND METHOD OF ASSEMBLING SPRINGS, Patented July 14, 1931, by John F. Gail, of Evanston, Illinois, Assignor to Simmons Company, of New York, N. Y., a Corporation of Delaware.

Starting with a reel of wire for the coiling of the springs and a reel of suitable fabric, such as burlap or gunny sack, folded upon itself lengthwise to form a two-ply strip, the strip is advanced endwise, the coil springs are formed, then compressed axially into substantially flat form, then inserted edgewise into the open side of the two-ply strip and held flat between the sides of the strip while the latter is closed by a seam along its open edge and the spring-containing pockets are completed by transverse seams between adjacent springs, and finally the springs, lying crosswise of the pockets, are turned to bring their axes lengthwise of the pockets and allowed to expand in and fill the latter, thereby forming into continuous lengths, which are later cut into suitable lengths for the mattress.

* * *

No. 1,813,197, CABLE FORMING APPARATUS, Patented July 7, 1931, by Lester O. Reichelt, of Cranford, New Jersey, Assignor to Western Electric Company, Incorporated, of New York, N. Y., a Corporation of New York.

A preferred embodyment of the invention contemplates a normally stationary but rotatable drum or wire strand supply carrier, having a ceneral passage for the strands through which are drawn by any suitable means. The strands are then drawn through a stationary distributing plate and then through a sizing die coaxial with the drum, whereby the strands are assembled into a compact group. A flver rotatable about the drum is provided with means to carry the assembled strands bodily around the strand supplies to introduce two twists in the strands for every revolution of the flyer.

* * *

No. 1,815,779, COILED FILAMENT AND PROCESS OF MAKING IT, Patented July 21, 1931, by Fritz Koref and Kurt Moers, of Berlin, Germany, Assignor to General Electric Company, a Corporation of New York.

This invention covers a process of making a coiled tungsten filament for electric light bulbs, and includes in first winding the tungsten wire into a helical coil and then treating the coiled wire to develop a single undistorted crystal of sufficient length to constitute a turn of the coil. The wire is treated by heating it to the highest practicable white heat.

* * *

No. 1,815,532, WIRE DISPENSING MEANS, Patented July 21, 1931, by Henry Augustus Vesey, of Ft. Smith, Arkansas.

This is a device for dispensing coiled wire, a container for the coil of wire being provided with a coiled-wire sleeve, from which the wire emerges and is drawn from the container and thorugh the sleeve as required.

Outstanding Personalities of the Wire Industry

A. A. Bloomburg, Resident Manager of the Hazard Wire Rope Company of Wilkes-Barre, Pennsylvania, is noted particularly for his experience in installing cost systems and efficiency methods and in the standardization of processes. He was educated in Public Schools and studied accounting and business administration at the University of Pennsylvania, Wharton School of Accounts and Finance.

In July 1916, he became associated with the Hazard Manufacturing Company, devoting himself to the study of wire and its manufacture in the capacity of Accountant and Auditor.

He was instrumental in the installation of a cost system and the standardization of processes, in relation to copper wire and iron and steel wire and their ultimate fabrication into electrical wires and cables and wire rope.

In 1927 when the Hazard Wire Rope Company was formed to purchase the wire rope division of the Hazard Manufacturing Co., (the Insulated Wire Division was subsequently purchased by the Okonite Company) Mr. Bloomburg became assistant to the General Manager and on May 1st, 1930 was appointed Resident Manager and elected to the Directorate.

C. F. Wiley has been appointed sales manager of the electrical and wire rope department, Chicago, of the American Steel & Wire Company. He fills the vacancy caused by the death of **C. S. Knight.** He has been associated with the rope department for 15 years.

✦ ✦ ✦

Charles H. Jockmus, prominent Ansonia manufacturer and philanthropist, died June 29th, at his home in New Haven.

Mr. Jockmus was sole proprietor of the Ansonia Manufacturing Company and was referred to as "The Edison of the Brass Industry". Although a stockholder in numerous corporations, he devoted his entire attention to the management of his company to the almost exclusion of all other business interests, working hard to attain the success he achieved. Mr. Jockmus was born September 17, 1861, at Middleville, N. Y.

✦ ✦ ✦

Colonel Andrew B. Lea, a Major of the 112th Engineers during the World War and Cuyahoga County surveyor, died suddenly of a heart attack at the age of 53.

Colonel Lea was born in Carnegie, Pa., and came to Cleveland while a young man as engineer for the American Steel & Wire Company.

Arthur D Fiske, traffic manager of the Worcester, Mass., district for American Steel & Wire Co., Cleveland, retired July 1 after 47 years with the American company. He is succeeded by **Robert H. Haley,** his assistant.

✦ ✦ ✦

Frank W. Jones, for many years Philadelphia sales manager, Eastern Steel Co., Pottsville, Pa., whose plant recently was sold in receivership proceedings, now is general manager of Hanover Wire Cloth Co., Hanover, Pa.

✦ ✦ ✦

Ellsworth L. Mills, formerly sales manager for the Bastian-Blessing Company, makers of welding equipment has been elected vice-president of the company. Mr. Mills continues in charge of sales.

As president of the Gas Products Association, he has done considerable to promote better marketing methods among all competitive companies.

✦ ✦ ✦

E. R. Norris has been appointed assistant to the general works manager and **C. G. Bunnell,** formerly purchasing agent at East Pittsburgh, will now function as general purchasing agent of the Westinghouse Electric & Mfg. Co.

William C. Fisher, who for the past fifty years has been in the employ of the Russell Manufacturing Company of Middletown, has recently resigned as general manager and treasurer. He will serve the company in the capacity of vice president, but will be relieved of the larger portion of his duties.

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Daniel Weedon, who has been named as general manager, started his new duties on June 1.

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R. D. Livingston, formerly vice president of the Signode System, Inc., and its successor, the Signode Steel Strapping Company, has been appointed general manager of the Consolidated Steel & Wire Company, manufacturer of box strapping, bale ties and package reinforcement equipment, with headquarters at 18 Tremont St., Boston, Mass.

✦ ✦ ✦

The appointment of **T. R. Langan** as northeastern district manager of the Westinghouse organization with headquarters in New York City has been announced.

Mr. Langan has been with the Westinghouse Company for more than twenty years, starting as an apprentice in the engineering department.

Exports and Imports of Wire

Exports of iron and steel wire products in May and June, 1931
(In gross tons)

	June 1931	May 1931	June 1930
Wire rods	2,412	4,532	4,479
Hoops, bands and strip steel	1,695	3,066	3,249
Plain black or galvanized iron or steel wire	964	1,181	1,872
Barbed wire and woven wire fencing	1,705	3,028	4,790
Woven wire screen cloth	63	86	144
Wire rope	194	254	450
Insulated iron or steel wire and cable	24	18	17
Other wire and manufactures	335	345	625
Wire nails	616	585	625
Tacks	48	35	47
Other nails including staples	271	288	437
Bolts, machine screws, nuts, rivets and washers	344	495	783
Total, these 12 classifications	8,671	13,913	17,518

Imports of iron and steel wire and wire products into the United States
(In gross tons)

Concrete reinforcement and other bars	8,043	6,074	2,419
Wire rods	564	669	955
Barbed wire	857	606	368
Round iron and steel wire	280	258	428
Telephone and telegraph wire	4		1
Flat wire and strip steel	25	48	96
Wire rope and strand	206	160	340
Other wire	32	16	34
Hoops and bands	1,633	1,390	1,572
Nails, tacks and staples	860	750	716
Bolts, nuts and rivets	6	72	23
Total, these 11 classifications	12,510	10,043	6,952

EXPORTS of iron and steel products in June declined 15,822 gross tons from the May total, while imports registered a slight gain of 643 tons. Wire rod exports declined 2120 tons.

EXPORTS of iron and steel wood screws in June were more than twice as large as May shipments, increasing to 378,143 gross, valued at $40,014, while brass wood screw shipments almost doubled, to reach 16,016 gross, valued at $4,669.

OF the receipts of card clothing —10,292 square feet, valued at $14,886—10,196 square feet, worth $14,707—originated in the United Kingdom. Imports of wire cloth and screening (24,727 square feet) came from Germany (12,055 square feet), Canada (7,334 square feet), France (3,392 square feet), and the Netherlands (1,946 square feet). Those of fourdrinier and other paper-making wires totaled 62,275 square feet, France supplying 30,713 square feet, Austria 17,748 square feet, Germany 13,238 square feet, and Sweden 576 square feet.

IMPORTS of wire fencing and netting, galvanized before weaving, totaled 873,750 square feet, 688,500 square feet being received from the Netherlands and 185,250 square feet from Germany. Receipts of the same material, but galvanized after weaving, totaled 2,177,400 square feet, 1,136,250 square feet being bought from the Netherlands, 607,500 square feet from Germany, 347,250 square feet from Belgium, and 86,400 square feet from the United Kingdom.

WIRE heddle imports amounted to 1,024,000 pieces, all originating in France. The trade **in wood screws dropped to 9,567** gross, valued at $1,216. Of this trade, 8,675 gross worth $946 came from Sweden.

New Literature

W. S. Rockwell Company of New York City, have a chart No. 237, entitled "Steel Heat-Treatment Chart". This chart embodies, in compact form, the factors that are ordinarily involved in the heat-treatment of steel and gives data of real interest to all manufacturers of steel and steel products.

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New Wire Machinery

Description of Recently Developed New Tools of Interest to the Wire Industry ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼ ▼

TO effect still greater savings in the production-line, the Ford Motor Company has acquired a ring coiling machine designed and manufactured by Sleeper & Hartley, Inc., of Worcester, Mass., for installation in the River Rouge Plant.

The machine coils 3/8" x 1" Maxel, a tough special alloy steel, edgewise into 14-inch rings. These rings are the blanks for the Fly-wheel Ring Starting Gear which is used on all Ford motors in the Model A and AA chassis.

Designed on the fundamental principles of all Sleeper & Hartley spring coiling machines, the machine designed for Ford turns out 25 rings a minute cutting each blank to exact size so that the ring is ready for immediate butt welding. After this operation it is annealed and machined, 112 teeth being cut in the circumference. In operation the ring is pressed over the engine fly-wheel where it is engaged by the starting motor pinion.

The huge new machine, weighing over 15 tons, is, like so many of the more modern machines, a development of experience and experimentation. The Ford plant for some time has been using one of the largest Sleeper & Hartley spring coilers to form these rings but this machine, while delivering the goods, did not have the weight and strength to do the best possible work with a minimum of trouble. Previous to this, rings were either cast into the flywheel or were punched out. The teeth on the flywheel castings had a discouraging habit of breaking off after some period of use, while with the punchings distortion, bad grain and heavy waste were the difficulties.

The coiled ring eliminates these difficulties. The rings, which come from the machine flat, are readily held to a tolerance of .0025", the grain in the metal follows the curvature of the ring, and wasteage is cut to the absolute minimum.

Operation

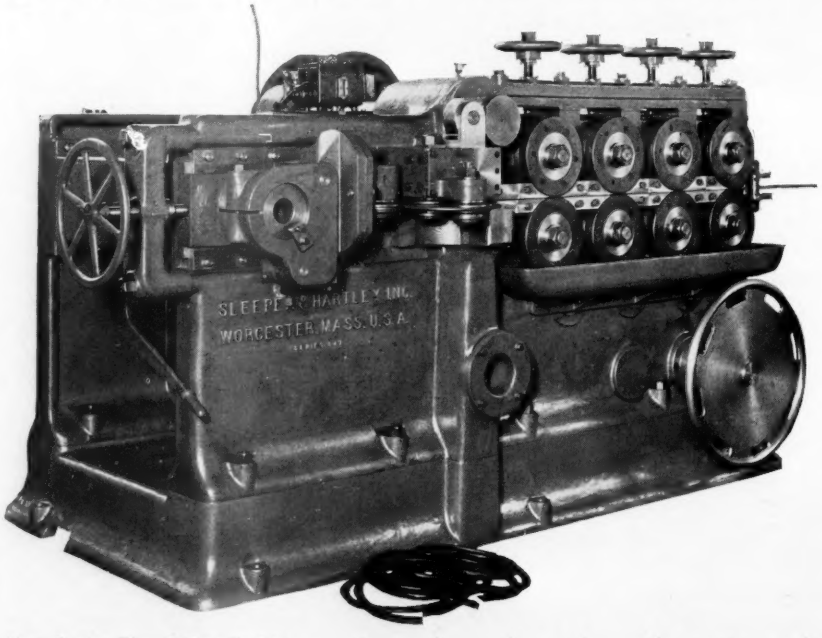
In operation the stock is fed from 400-lb. bundles to the coiling mechanism through a series of four pair of rolls having knurled surfaces to grip the strip under heavy pressure. On emerging from the feed rolls the stock is started in the desired curvature by deflector rolls. The strip then passes between coiling rolls which give the ring its final shape, and which are completely adjustable with extreme accuracy.

The ring is then guided to the shear by a series of rolls and at the proper instant the feed is stopped through a cam motion and the shear, with a pressure estimated at 300 tons, cuts the completed ring. By adjustment the ends of the ring can be made to overlap, just touch, or leave a decided gap. Since the ring is to be butt welded, the machine is adjusted to have the ends just touch. The rings go to the welder from the coiler on a conveyor.

Once welded, the rings are sized with a punch or the inner edge turned in a boring mill and the teeth are cut on the outside edge. Other operations of hardening and drawing follow, after which the ring is pressed onto the flywheel.

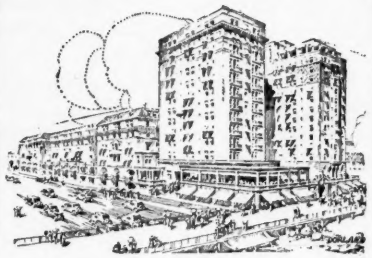
The operation of the machine, save for the feeding of the end of the new strip into the first pair of the eight feed rolls, is completely automatic. The machine is driven by a 30 H. P., 1200 R. P. M. motor with complete ease due to the fact that all bearings are of the ball or roller types. Hyatt, S. K. F. and Fafnir bearings have been used where best suited to a particular service. An over-load clutch has been provided to prevent any possible damage to the

(*Please turn to page 382*)



Ford Starter Ring Coiling Machine. ✦ ✦ ✦ ✦ ✦ ✦ ✦

The
St. Charles
On the Boardwalk
At New Jersey Avenue
ATLANTIC CITY



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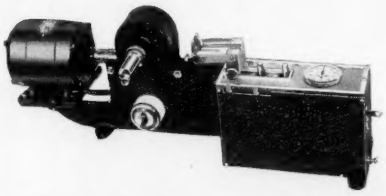
Machine Indicating Traction Required to Draw Wire

An instrument known as the TRIPLEX dynamometer, for testing all types of wire drawing dies, including tungsten and diamond, has been brought out by Robert Miller, 221 North Twenty-Third Street, Philadelphia.



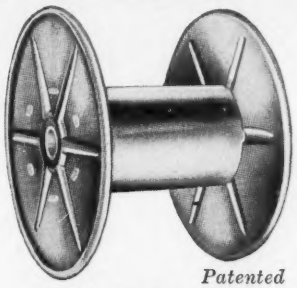
This machine is designed to indicate accurately the traction required to draw the wire through the die. It also indicates the ultimate breaking point of the wire after the efficiency of the die.

It is equipped with three scales, one reading from zero to 100 lbs; another from zero to 10 lbs., and the third from zero to 1 lb. This allows accurate readings to be made on tests down to the finest sizes of wire.

To use the instrument, the die is placed in the die holder, and the end of the wire is brought around the winding drum and fastened. The constant speed motor is then started and the wire passes through the die at a uniform speed, while the dial indicates the traction in pounds, tenths of pounds, or hundredths of pounds, according to which scale is being used. The change from one scale to another may be made instantly merely by moving the die holder to the projecting scale rod corresponding to the desired scale.

To make a breaking point test, the same proceedure is followed excepting that the end of the wire is fastened around a spool which fits in the die holder. The indicator is set so that it remains at maximum. Starting the motor breaks the wire, the indicator hand remaining at its maximum and allowing a reading until released.

As befits a laboratory instrument, it is handsomely finished with highly polished nickel trimmings, and is guaranteed to be accurate on all scales. It is 25 inches long, 8½ inches high, and weighs 38 lbs.



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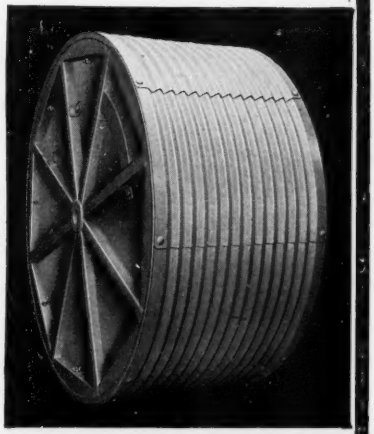

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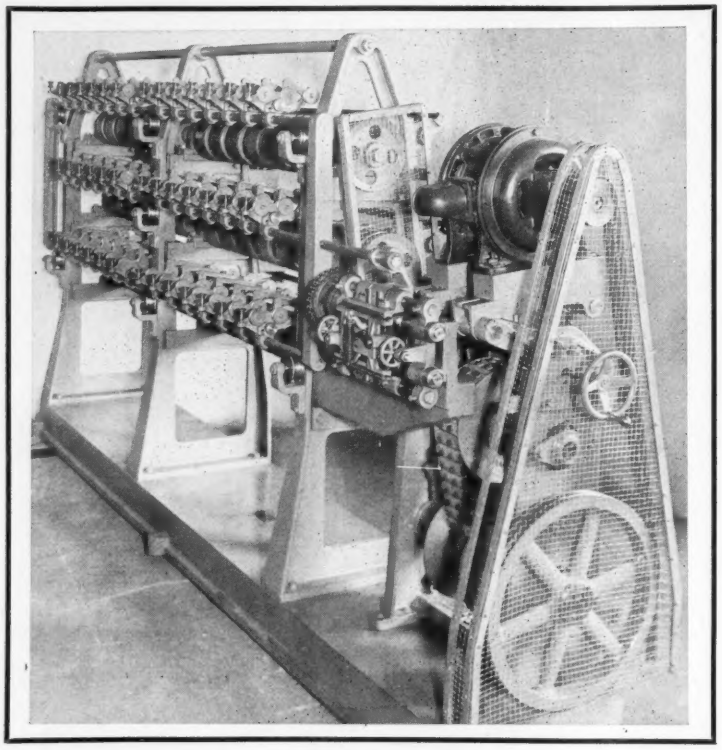
R. B. HAYWARD COMPANY
1714-1736 Sheffield Ave., Chicago
Under license arrangement with Electrical Research Products, Inc. Subsidiary of Western Electric Company, Incorporated.

Rod, Wire, Cable, Strip and Tube Machinery



42 Wire Spooler
For Use With Multi-Strand Bright Annealing Furnace

WE BUILD

Chain Draw Benches—Multiple Coil Winders.
Flat Wire Rolling Mills—Rod Pointers.
Hollow Wire Straighteners and Equipment.
Multiple Strand Bright Annealing Units.
Stranders to Customers' Specifications.
Reelers and Spoolers for all sizes of Wire and Cable.
Reelers and Spoolers for Tinning, Galvanizing, Patenting and Annealing.

Frederick M. Conran

Designer and Builder of Special Machinery

107 Colden St., Newark, N. J.

Galvanizing

(*Continued from page 361*)

more clearly visualized if we all could understand exactly what takes place. We have in the first place two soluble metals—steel and spelter. These two metals have a natural affinity for each other. We have a bath of molten spelter, we'll say at a temperature of about 850° F.; we introduce into it a scale-free steel which rapidly rises in temperature until equal to that of the spelter. Every degree of temperature which this steel wire absorbs brings it that much nearer to its own molten state and it begins to marry with the spelter and as long as this wire remains in the molten spelter this marrying continues. If it were possible to withdraw the wire then instantly in the same condition in which it is passing horizontally in the bath we would have just this coat of zinc iron alloy.

But in removing the wire from the bath a varying amount of pure spelter remains on it merely by adhesion. The amount and weight of this pure zinc coat can be varied to a marked degree by the method we use in removing it from the spelter. Speed influences this, vertical or horizontal take-out influences this, the depth of the sinker in the spelter influences this and of course the temperature of the spelter at the point of removal influences this.

So we find in the last analysis that galvanizing takes place by the marriage or absorption of these two metals and the pure zinc coat is placed by adhesion.

This is one of the reasons why it is so necessary to read into our tests of galvanized wire the weight of coating and not depend to any marked degree upon the copper sulphate immersions which the wire will stand. These alloy layers to which I have referred will withstand the action of the copper sulphate to a greater degree than will pure zinc, therefore their proportionate width in the zinc coat will have a marked bearing on the copper sulphate immersions which the coat will stand but the weight of coating will be the true measure of the serviceability of this protective coat.

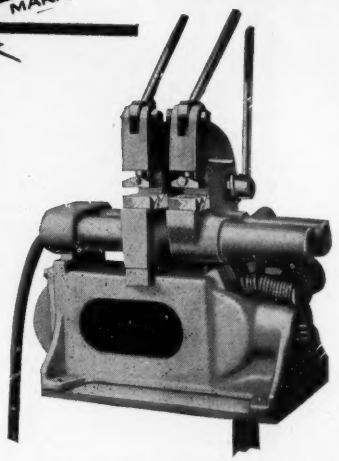
I have always been of the opinion that the pure zinc coat was desirable from the standpoint of withstanding normal atmospheric conditions and I have always desired a wider pure zinc layer and less of the alloy because it seems reasonable to suppose that if the iron is the corroding base the more iron contained in the zinc the more susceptible to corrosion. There are, however, arguments which tend in some cases to offset this theory and I have been rather concerned recently by the conclusions of Messrs. C. L. Hippensteel, C. W. Borgmann and F. F. Farnsworth of the Bell Telephone Laboratories which they have put forward as the result of some experiments which they have made and which you may find in the proceedings of the American Society for Testing Materials. These conclusions express the opinion that "no differences are found in the rate of loss between the zinc and zinc alloy layers of hot dipped coatings". However, regardless of the question of whether these gentlemen are correct in their conclusions or whether I am, certain it is that in galvanizing wire particular attention must be given to this coating structure from the standpoint of bonding and inasmuch as weight of coat is rapidly becoming of more importance in the wire field than copper sulphate dips, even though the gentlemen referred to were correct, it would not interfere on a question of durability of coat.

I wish to warn you then that the coming year is going to see heavier coatings called for and more rigid specifications in this field and it behooves all of us to pay attention to this situation ahead of time.

I do not want to close without calling your attention to a series of three articles which started in June issue of Wire and Wire Products. I refer to the controversy between Messrs. Rylands and Whitehead anent the merits of electro-galvanizing and hot dip galvanizing. It is a long time since I have seen such an interesting discussion relating to galvanizing and I recommend these articles for your consideration.

Thank you.

ONE MICRO-WELD USER:



"We think that this machine is superior to anything in the field today, as it has the qualities of larger machines at a minimum original cost."

(Name on Request.)

We have other letters like it—but we'd rather let MICRO-WELD sell itself to you by doing actual work right in your plant. If it doesn't live up to our claims of minimum first cost to you, and lowered production costs for you, return it.

Write for full details of our various models, and tell us something of your needs, so we will know what model to recommend.

MICRO PRODUCTS COMPANY

140 Industrial St. Peoria, Ill.

European Office, H. A. Schlatter & Co.
Zurich, 1, Limmatquai 32, Switzerland.

Patents—Trade Marks

All cases submitted given personal attention by members of the firm. Information and booklet free.

Patent Office and Federal Court Practice

Lancaster, Allwine & Rommel

PATENT LAW OFFICES

473 Ouray Building, Washington, D. C.

Reinforcing Bar Sizes Are Simplified

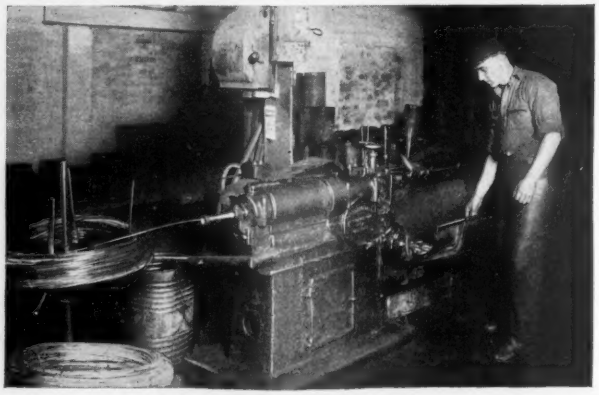
SIMPLIFIED practice recommendation R26-30 steel reinforcing bars, limiting the cross-section areas to 11 sizes, has been approved through the Department of Commerce through the Bureau of Standards in connection with the annual survey of the matter for revision. The sizes covered in the simplified practice, together with the practical bars employed in filling the recommendation, are as follows:

Sectional Area	Sizes and Sections of Bars
0.05 sq. in.	¼-in. round
0.11 " "	⅜-in. round
0.20 " "	½-in. round
0.25 " "	½-in. square
0.31 " "	⅝-in. round
0.44 " "	¾-in. round
0.60 " "	⅞-in. round
0.79 " "	1-in. round
1.00 " "	1-in. square
1.27 " "	1⅛-in. square
1.56 " "	1¼-in. square

The recommendation is subject to annual revision by the standing committee of the industry.

SHUSTER

Wire Straightening and Cutting Machinery



this plant has used SHUSTER Machines for 12 years, and they have four, which have been added from time to time as required.

Shuster Machines are designed to stand the hardest kind of service with practically no "shut downs" for repairs.

Timken Bearings, steel straightening fliers, etc.

Whatever your straightening problem there is a Shuster to meet it.

The F. B. Shuster Company New Haven, Conn.

STRAIGHTENER SPECIALISTS SINCE 1866

Metal Spools for Wire Drawing

Metal Spools for Annealing

Metal Bound Spools for Shipping

Metal Bound Reels for Shipping

Hubbard Spool Co.

1620-32 Carroll Avenue

Chicago

Wire in Everyday Life

(*Continued from page 362*)

the clasp of his Boston garter he notes it is made of wire as well as parts of his belt or suspenders. He bends over to tie his shoe and even the metal tip on his shoe lace was undoubtedly made of flat wire. The collar buttons pressed from flat wire, and the wire stick pin in place, he descends the velvet clad stairway, whose carpet could only have been fashioned through the use of wire, he sits down to breakfast.

✦ ✦ ✦

The menu, you may be sure, has been prepared with utensils made principally of wire. If the eggs were boiled they were undoubtedly nestled for three or five minutes in a wire basket or if he preferred; an omelet, and whether this was beaten by hand or with a motorized electric beater, wire was necessarily used in its construction. If he has time to read the morning paper, which may carry a first page exposure of graft or "wire pulling" we hasten to explain that the thousands of miles of wire produced in this country annually have no connection with the story referred to, but while his paper rests on the wire easel at just the proper angle an electric toaster and percolator are merrily radiating heat through their wire coils.

✦ ✦ ✦

It would be wearisome to follow him thus closely all day, but whether he travels to his place of business accompanied by the aristocratic purr of a ten thousand dollar motor or by the noisy rumble of an electric car or train, wire in some form, either motor springs, upholstery springs, ignition parts or a hundred and one other forms they help to expedite and make his trip more comfortable. Even the cement roadways over which he travels have been reinforced with wire. The elevator he enters is raised and lowered with wire ropes.

The electric fan and telephone in his office, the push button on his desk which summons Miss Stenographer, the inumerable parts on her typewriter or adding

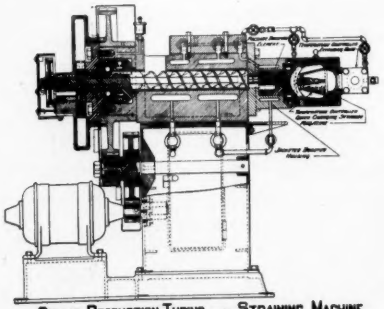
machine are principally made of wire. So through all the day he finds himself inevitably and unconsciously surrounded by wire and wire products.

And home again at night he settles down to enjoy that modern agency known as the radio, an instrument which could not function without wire. After that when he has turned off the last light thru the medium of a wire spring equipped button or switch he lies down to peaceful dreams on a form fitting spring mattress with the abiding thought that this is truly "the age of wire".

✦ ✦ ✦

Super Production Tubing and Straining Machine

THE introduction of the Super Production Tubing & Straining Machine to the wire and rubber industries presents many interesting and valuable features, distinctive among which are its lack of the necessity of massive construction characteristic of worm type of machine at present in use for either straining or extruding rubber mixtures in any form.



SUPER PRODUCTION TUBING AND STRAINING MACHINE

The massiveness is rendered unnecessary through the elimination of the heavy frictional worm drag and its heat producing slippage with its resulting inefficiency, which is eliminated in the introduction of practical means of building up exceedingly high delivery pressures with only nominal worm thrust, or enough only to deliver the compound through a large aperture in the intake side of the pressure boosting element.

Pressures and volume amply high to permit the introduction

HUDSON WIRE CO.

Successors Royle & Akin

Fine Wire Manufacturers

OSSINING Established 1902 NEW YORK

Manufacturers of Fine Bare Wires

Copper Wire Specially Processed for Enameling Purposes

Copper	Lead
High Brass	Zinc
Low Brass	Commercial Bronze
Pure Tin	Phosphor Bronze
Cadmium	Silver Plated Copper
Bronze, Various Grades	False Gold

10%, 18%, 30% Nickel Silver

LAHN

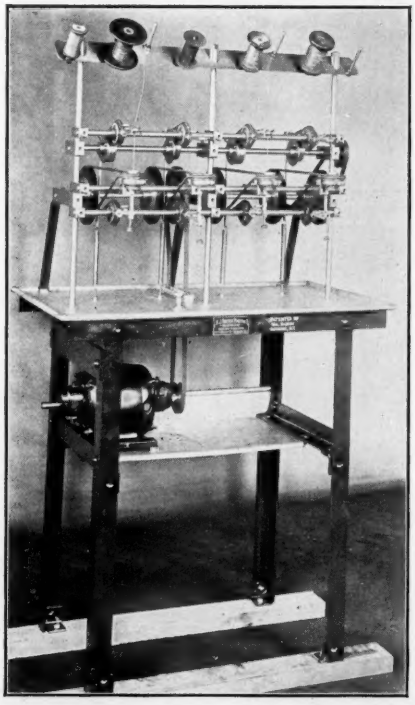
False Gold Copper Silver Plated Copper

BRUSH WIRES CRIMP and STRAIGHT

Brass Copper
Steel Nickel Silver
Phosphor Bronze

Metallic Fibre for Packing Purposes

The Haddow Die Re-Cutting and Polishing Machine will lower your die re-cutting cost to a fraction of present costs



Why do you continue to pay a die cutter and pay for diamond dust to remove a large percentage of your diamond from your dies? Diamond that has done no work—when, by the use of the Haddow Die Recutting Machine you may use practically all your diamonds to draw wire, especially in the small sizes.

ONE MONTH'S SHOP PRODUCTION

Total number of dies cut —1047

Total number of hours required—182.5

Average number of dies per hour—5.73

Number of operators—1

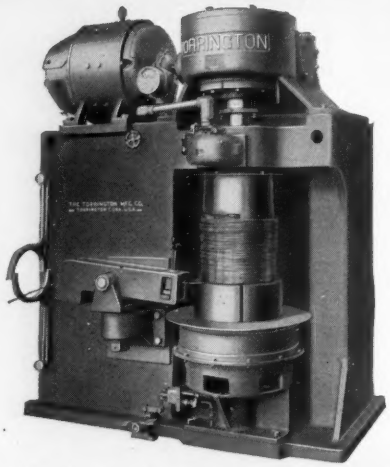
With only one man—This machine will do the work now requiring four to six men in less time and at lower cost.

4 HEAD MACHINE—Also Made in 6-Head size (With 2 Heads for Heavier Dies).

WILLIAM HADDOW

17 Eastern Ave.

Ossining, N. Y.



No. 1382

Inverted Wire Block

A single die wire drawing machine of the suspended block type with coil with-drawn without the necessity of lifting over top of block. Special two-piece drawing block in combination with receiving table for long lengths. Machine is driven by motor located on top of pedestal through worm and worm gear. Full electrical control provided, including slow initial starting speed, converting automatically to a predetermined and adjustable drawing speed. Instantaneous stopping upon completion of draw or in case of broken wire. Safety switch provided. All electrical control equipment enclosed in base of pedestal. The block made in three sizes with any block diameter up to 24".

THE TORRINGTON MFG. COMPANY

TORRINGTON, CONNECTICUT, U. S. A.

RUESCH

WIRE FLATTENING MILLS

COILERS — DRAW BENCHES — STRAIGHTENERS — SWAGERS

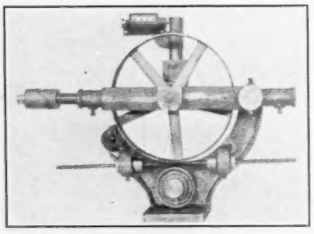
SPECIAL MACHINERY DESIGNED AND BUILT FOR WIRE, TUBE AND BRASS MILLS

H. J. RUESCH MACHINE CO.

409 MULBERRY ST. NEWARK, N. J.

IMPROVED

Wire Measuring Machine



For measuring bare and insulated wire.
The new patented double grip model gives you more correct measurements.
You save the difference.
Eight different types will measure the finest wire up to and including 3-inch cable.
All equipped with "VISIBLE" counters.

Manufactured by

HOPE NARROW FABRIC CO.

68 Althea St., Providence, R. I.

Builders of Improved Braiding Equipment for more than 25 Years.

of the straining operation between the pressure boosting element and the extruding dies are easily accomplished, in combination with tremendous increases in machine production over the best designs of the worm type of machine, resulting in great savings in production costs both from the enormous increase in production and the elimination of the separate straining operation.

Other advantages of the machine are:

Elimination of burned compound by its rapid positive passage through the machine, promoted by the positive action of the Booster element.

Saving in valuable floor space both in room taken by the machine itself, and the room occupied by machines displaced for reason of its greater efficiency.

Saving in carrying charges on the low investment per unit of production, and many other savings resulting directly from those already mentioned.

✦ ✦ ✦

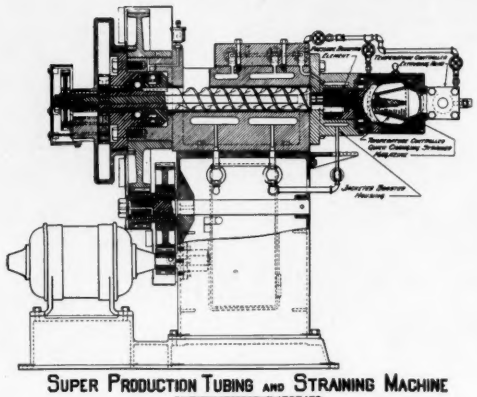
This machine is manufactured by **The Corone Wire Insulators, Inc.**, of Putnam Conn., which was organized by E. Howard Johnson, and incorporated August 1st, 1928, and has conducted a successful business in insulating mixtures devised by them for combining with rubber and other ingredients under their formulas, in the production of superior high tension resisting insulations for high tension wire coverings.

✦ ✦ ✦

The Allegheny Steel Co., recently received an order for 3300 pounds of chrome steel wire for guying telephone poles by the Empresa de Telefonos Ericsson, Mexico City. This wire is a straight chromium-iron alloy containing 12 to 16 per cent chromium with a diameter of 0.203-inches is cold drawn, annealed and pickled, and has a tensile strength of about 75,000 pounds at room temperature.

The wire is to be used in regions where the salt air causes rapid corrosion of the galvanized product.

Of Vital Interest to Insulated Wire Industry



SUPER PRODUCTION TUBING AND STRAINING MACHINE
PAT. Nos 1819869 & 1885470

Uniformity of diameter of extruded wire covering

Uniformity of covering speed

Covering speed only limited by panning or reeling efficiency. Its maximum covering speed has never been reached for this reason

Perfectly clean insulation assured by sealed delivery of strained compound to the wire, a feature of exceeding value in water test wire

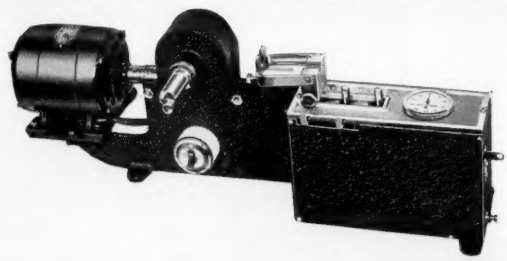
Tremendous reductions in insulating costs by more than doubling speed of production, and additional reductions by combining straining with the tubing operation

Thin walls on small wires, impossible on the worm propelled extruder, are produced at excessively high speeds with ease

Soft compounds practically impossible to extrude economically with worm feed alone, extruded at high speed.

For Detailed Information Address—

Corone Wire Insulators, Inc.
PUTNAM, CONN.



FOR TESTING
DIAMOND WIRE DRAWING DIES
The

"Triplex" Dynamometer

3 Scales
0-1 lb. 0-10 lbs.
0-100 lbs.

Length 25″
Height 8½″
Weight 38 lbs.

Accurately indicates the traction required to draw wire.
May be set so that indicator hand remains at maximum reading, allowing ultimate break tests to be made.
We will place this dynamometer on trial in your plant upon request.
YOUR INQUIRIES SOLICITED

ROBERT MILLER

221 NORTH 23d ST., PHILADELPHIA, PA.

THE Otis Steel Co., has completed the installation of a new hot bed for the 20-inch strip mill department at a cost of $400,000. The new equipment, which is being placed in use, is designed to increase the efficiency of the strip mills. Specially designed flying shears and pilers are being constructed for this department also. The work on the installation of the hot bed was started early in June. Satisfactory progress is being made in the construction strip mill which the company expects to have in operation late this year.

Cables for New York Edison System Will Require 60,000 Tons of Lead

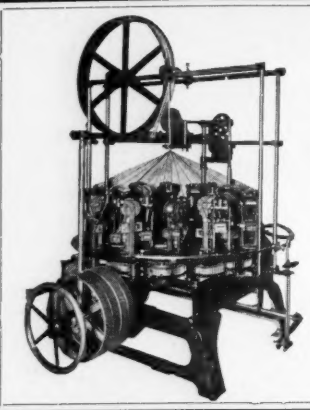
MORE than 60,000 tons of new lead will be utilized in the manufacture of cables to be installed by the New York Edison System in its underground transmission and distribution system in the ten years 1931 to 1940, inclusive, according to the information supplied by Lead Industries Association by the company. New cable to be installed in this period will have approximately 80,000 tons of lead sheating. Old cable to be retired has about 18,000 tons of lead sheathing.

Bright Anneals Stainless Wire

AN annealing process which turns out stainless steel wire, rod and strip with a luster that needs only a minimum amount of buffing to give it a high polish, has been developed by the **Alloy Metal Wire Co., Inc., Moore, Pa.**

✦ ✦ ✦

THE Newark Wire Cloth Co. 351-365 Verona Ave., Newark, N. J., manufacturers of wire cloth for every service, announce that they have appointed **The Pacific Metals Co., Ltd.,** as West Coast representatives. The Western agency will carry a limited stock both in Los Angeles and San Francisco.



WIRE BRAIDERS

Multiple Head Wire Covering Braiders

Single, Double or Triple Deck Wire Covering Braiders

Single, Double or Triple Deck Cable Braiders

FIDELITY MACHINE COMPANY

Philadelphia, Pa.

WIRE BUNCHING MACHINES
WIRE STRANDING MACHINES
TWINNING MACHINES Up to And Including
SEVEN CONDUCTORS

(Manufactured under the Dawes Patents)

HASKELL-DAWES MACHINE CO., INC.

Ontario St. Below Trenton Ave.,
Philadelphia, Pa.

PATCH VULCANIZER FOR REPAIRING RUBBER COVERED WIRES

EST. 1855 AIMCo INC. 1918

"American" INSULATING MACHINERY COMPANY

REG. U.S. PAT. OFF.

517 Huntingdon St.
PHILADELPHIA PENNSYLVANIA USA.

Electric Heat--Thermostatic Control

Alternating or Direct Current 110 Volts

High—Medium—Low—Three Heat Switch

Valuable in any Plant for Patch-Repairing Rubber-Covered-Wires or Cables

Price will be quoted upon advice as to the number of grooves in the molds and selection of sizes. Following sizes are standard; other sizes are special:

.125", .160", .180", .1875", .200", .225", .250", .275", .300", .3125", .320", .350", .357", .375", .400", .417", .425", .4375", .488", .500", .529", .576", .625", .684", .750", .875", 1.000", 1.125", 1.250", 1.375", 1.500".

WIRE INSULATING, STRANDING AND CABLING MACHINERY

NEW ENGLAND BUTT COMPANY

Office and Factory
304 Pearl St., Providence, R. I.

Western Office
20 North Wacker Drive, Chicago, Ill.

We build a complete line of Stranding Machines, Cabling Machines, Closing Machines, Rubber Strip Covering Machines, Measuring Machines, and Other Allied Machines for the Wire Trade.

OUR WIRE MACHINERY CATALOGUE SENT ON REQUEST

Wire Measuring Machines

A complete line of eight different types of wire measuring machines for bare and insulated wire including all sizes from the finest wire up to big three inch cable wire, is announced by the **Hope Narrow Fabric Co.**, 68 Althea Street, Providence, R. I.

These machines are all equipped with visible point counters enabling the operator at all times to read the dial on the counter from any angle without changing his position or walking around the machine, as is necessary in other types of wire measuring machines.

The manufacturer claims that these machines will give more correct measurements than any previously developed. This company also builds braiding and spooling equipment for the wire industry.

✦ ✦ ✦

Coil Winder For Paper Insulator Coils

AN interesting development in the method for more efficiently produced paper insulator coils has been announced by the **Universal Winding Company** of Auburn, R. I.

In this machine the paper is injected automatically without attention from the operator and the machine is fully adjusted for a wide range of coil and wire sizes.

The entire line comprises six machine types of coil winders designed to meet any possible need.

✦ ✦ ✦

Aluminum Wire Fences

ONE of the recent developments in the fence industry has been the adoption of aluminum for the manufacture of woven wire fences. It is non-corrodable and does not require periodic painting to keep it in perfect condition.

Although the initial cost is higher than for fence made from other metals, it is claimed that it is actually lower in cost over a period of years, when all factors are taken into consideration.

A booklet entitled "Why Aluminum Fence" outlining the development of aluminum, can be secured from the **Page Steel & Wire Company, Bridgeport, Connecticut.**

German Galvanizing Practices*

AS stove zinced wire is mostly a semi-finished product and must be further worked the most waste occurs on account of this further working. The zinc layer scales off. In the case of mattress chains, hooks, eyes and the like which are not subjected to the influence of the weather, this is not so important; but as soon as the wire as finished product is subjected to all the influences of the weather, the scaling off soon makes itself apparent in an objectionable manner. Complaints are received by the suppliers from consumers and dealers and the reputation and confidence is often seriously damaged on this account. The consumer is always of the opinion that the firm has employed inferior raw material in order to save. In most instances this is however not the case. Every firm desirous of supplying good, perfect galvanised wire only employs a good perfect raw material. Nevertheless faults do occur which might absolutely have been avoided by proper treatment.

✦ ✦ ✦

In the first instance it is the duty of every responsible manager of a Works not to depend upon chance in his Works. The Works must turn out uniform products at all time and in order to effect this, a primary condition is the measuring and controlling of the furnace temperature and of the zinc bath. Only by this means is it possible to ensure an always uniform material.

✦ ✦ ✦

The opinion hitherto general regarding the zinc coating was that the fire zinced wire coating must be as thin as possible, otherwise a good flexibility of the wire will not be obtained.

✦ ✦ ✦

If a galvanised wire is cut through, a layer-like coating can clearly be seen under the microscope after grinding the cross section. Over the iron core there is a layer composed of iron and zinc

*From Draht-Welt, Hall Salle, Germany.

WIRE DRAWING Machinery and Equipment

Rod Frames—16" Frames
8" Frames—Take-Up Frames
Wire Pointers—Puller Tongs
General Castings for Wire Mill Use
Circulars on Request.

E. J. SCUDDER FOUNDRY & MACHINE CO. TRENTON N. J.

STEELSKIN
REG. U. S. PAT. OFFICE
For High or Low Carbon Wire
WIRE DRAWING SOAPS
Established 25 years.
R. H. MILLER CO., Inc. Homer, N. Y.

The Standard for High Carbon Wire
English Brand Wire Drawing Soap
Proven efficiency by years of continuous use.
THE J. T. ROBERTSON CO., INC.
SYRACUSE, N. Y.
Wire drawing soap specialists since 1893.

ELECTRIC and FUEL FURNACES
for
Ferrous and Non-Ferrous Wire Products
Complete heating equipment for strand annealing, billet heating and intermediate operations.
Bright annealing furnaces for ferrous and non-ferrous metals.
"Furnace and Fuel to Suit Conditions"
W. S. ROCKWELL COMPANY
Industrial Heating Equipment
50 Church Street (Hudson Terminal Building) New York
1885-1

BALLOFFET

1870 — 1931

The Quality Diamond Dies

Balloffet Diamond Wire Dies Co., Inc.

13-15 East 22nd St., New York City

PLANTS AT

New York Lagnieu (France) Cluses (France)

Trevoux (France)

DETROIT WIRE DIE COMPANY

DIAMOND AND TUNGSTEN CARBIDE DIES FOR WIRE DRAWING

We manufacture our complete diamond dies in this country from the very finest diamonds that are obtainable. We have made a study of wire drawing problems and manufacture the dies to fit your problems.

WE WOULD APPRECIATE AN OPPORTUNITY TO SERVE YOU

Detroit Wire Die Company 6106 Linwood Avenue, Detroit, Mich.

VIANNEY

DIAMOND DIES

100 FIFTH AVE · NEW YORK

"The House of Service"

Bellet Diamond Die Works

Manufacturers of

DIAMOND DIES

and

COMPOSITION DIES

Factories { Trevoux—France / New York, N. Y.

New York Office 315 Fifth Ave.

and the zinc layer which has the same composition as the zinc in the bath lies on this first layer. This zinc layer is that which is important for the durability of the wire.

In the case of the first mentioned iron-zinc alloy coating, this is an inter-crystalline combination. This iron-zinc compound, as is generally known, is extremely brittle and only allows very slight deformation. As the pure zinc layer however lies on this intermediate layer, it will be clear that, when bending the wire, the hard zinc layer immediately breaks so that the pure zinc layer scales off. The scaling off occurs more easily the thicker the hard zinc layer is.

It will be apparent from that which has been said that the thickness of the zinc coating is not a deciding factor, for the flexibility of the wire, but only the thickness of the hard zinc layer.

✦ ✦ ✦

If it is desired to produce a flexible galvanised wire, it is essential to take care that no or only an extremely thin hard zinc layer is produced.

The Waterbury Wire Die Co.

Diamond, Composition and CHILLED IRON DIES

Waterbury, Conn.

In order to obtain this, the reaction intensity, i. e. the combining of the zinc with the iron, must be made as small as possible. The temperature of the zinc bath must also not attack the wire.

In this connection however two mistakes can be made:

1. The zinc bath is too hot, the traveling speed of the wire is too low and the thin wire is strongly attacked by too hot zinc baths. The zinc penetrates deeply into the wire and forms a very thick hard zinc layer.
2. The wire has become too hot when passing through the furnace. As soon as the glowing wire comes into contact with the air, scale forms which does not deposit in the pickle trough, but in the zinc bath and a new chemical combination with the zinc occurs, this compound is hard zinc.

✦ ✦ ✦

In order to avoid this objection, care must absolutely be taken that the melting point of the zinc is not exceeded too far. An increase of temperature of from 10 to 50°C has already a very bad influence on the wire. The simplest precedure is to continually control the bath with an electric thermometer[1] or pyrometer[2].

✦ ✦ ✦

That which has been said shows that the zinc bath temperature and the speed of travel of the wire are the factors which determine the thickness of the iron-zinc layer. A good flexibility of the wire can only be obtained if particular value is attached to this point.

✦ ✦ ✦

[1]Specially constructed distant thermometers for temperature measuring in zinc baths are supplied by the Askania-Werke, Berlin-Friedenau. These instruments are provided with a restricted measuring range in order to obtain a maximum accuracy of reading of the small temperature gradations.

[2]Various kinds of pyrometers, especially for zinc baths, are supplied by the Platinschmelze G. Siebert, G.m.b.H., Hanau.

✦ ✦ ✦

The Third paper on Automatic Combustion Control Systems will appear in November

The results you get in drawing wire depend upon the

Experience

of your die maker—we learned that before we made "Premier" Diamond Dies.

DRIVER-HARRIS COMPANY
HARRISON, N. J.

MASTER Tungsten Carbide Drawing Dies
for **Wire, Rod, Tubing and Specialties**

Made by patented precision machinery insuring exact shape duplication. Lower production costs decrease rejections

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Office and Plant: 480 CONCORD AVE., NEW YORK

THE MOST RELIABLE
DIAMOND DIES
ON THE MARKET TODAY
USE OUR DIES
FOR SAFE and SUSTAINED PRODUCTION

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WIRE DRAWING DIAMOND DIES
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ADDOR
WIRE DIE WORKS

Diamond Dies in all sizes
For all kinds of Wire
Crushing Bortz and Splints.
Dies repaired like new.
YOUR INQUIRIES SOLICITED
104 Fifth Avenue
New York City

BUYERS' GUIDE

For more complete information, consult the annual Directory, Index & Buyers' Guide.

ANNEALING FURNACES
See Furnaces—Various Headings

ANNEALING POTS
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.

ARMORING EQUIPMENT
Amer. Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
John Robertson Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

BAKERS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

BOBBINS
Mossberg Pressed Steel Co., Attleboro, Mass.

BRAIDER CARRIERS
Mossberg Pressed Steel Co., Attleboro, Mass.

CASTINGS—Wire Mill
E. J. Scudder Foundry & Machine Co., Trenton, N. J.

CLEANING & PICKLING EQUIPMENT
Vaughn Machinery Co., Cuyahoga Falls, O.

COILERS—Sheet and Wire
H. J. Ruesch Machine Co., Newark, N. J.

COPHOLDERS
Mossberg Pressed Steel Corp., Attleboro, Mass.

CRANES—Wire Mill
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

DIE TESTING DYNAMOMETER—To Indicate Traction Required To Draw Wire
Robert Miller, Philadelphia, Pa.

DIES—Chilled Iron
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Composition
Addor Wire Die Works, N. Y.
Bellet Diamond Die Works, N. Y.
F. Krause, Inc., Jersey City, N. J.
Urdika Wire Die Works, Inc., New York
Vianney Wire Die Works, New York, N. Y.

DIES—Diamond
Addor Wire Die Works, N. Y.
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Bellet Diamond Die Works, N. Y.
Cochaud Wire Die Co., New York.
Detroit Wire Die Co., Detroit, Mich.
Driver-Harris Co., Harrison, N. J.
F. Krause & Co., Inc., Jersey City, N. J.
Master Wire Die Corp., New York, N. Y.
Union Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York.
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Addor Wire Die Works, N. Y.
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Bellet Diamond Die Works, N. Y.
Cochaud Wire Die Corp., New York.
Detroit Wire Die Co., Detroit, Mich.
F. Krause & Co., Inc., Jersey City, N. J.
Vianney Wire Die Wks., N. Y.

DIES—Recutting and Repolishing Machine
Wm. Haddow, Ossining, N. Y.
F. Krause, Inc., Jersey City, N. J.
Vianney Wire Die Works, New York, N. Y.

DIES—Rod and Tube Drawing
Carboloy Co., Inc., Newark, N. J.
Master Wire Die Corp., N. Y.
Union Wire Die Corp., N. Y.
Vianney Wire Die Works, New York, N. Y.

DIES—Tantalum Carbide
Vianney Wire Die Works, New York, N. Y.

DIES—Tungsten Carbide
Bellet Diamond Die Works, N. Y.
Carboloy Co., Inc., Newark, N. J.
Master Wire Die Corp., New York, N. Y.
Union Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.

DRAW BENCHES—
H. J. Ruesch Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Machine Co., Trenton, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry & Machine Co., Waterbury, Conn.

FURNACES—Annealing
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

FURNACES—Automatic
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

FURNACES—Bright Annealing
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

FURNACES—Electric
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

FURNACES—Lead Melting
John Robertson Co., Brooklyn, N. Y.

FURNACES—Non-Oxidizing
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

FURNACES—Wire
Chas. F. Kenworthy, Inc., Waterbury, Conn.
W. S. Rockwell Co., New York, N. Y.

GALVANIZING ENGINEER
W. H. Spowers, Jr., New York, N. Y.

Manufacturers of ornamental and architectural iron work are requested to send their catalogs to R. H. McLeod, Secy., Dyne & Co. Ltd., New Farm, Brisbane, Queensland, Australia.

WANTED—Man who has specialized in Diamond Steel setting, Die casting or pressing. Must be thoroughly experienced. Apply to Box 200, Wire & Wire Products, 551 Fifth Ave., New York, N. Y.

WANTED—INSULATED WIRE SALES ENGINEER, who has had experience with enamel, cotton and other insulated wires, preferably in the sales end, and who has a knowledge of motors, armatures and transformers. State age, education and past employment, Box 600, Wire & Wire Products, 551 5th Ave., New York, N. Y.

The Next Article in The Discussion, Electro Galvanizing vs. Hot Galvanizing, Will Appear in the October Issue of WIRE and WIRE PRODUCTS.

(*Continued from page 370*)

machine in the event of an unforeseen jam.

Every possible practical safety device has been incorporated in this machine. A control clutch lever is located on either end of the machine. The handwheel, of the closed spoke type, is of steel to prevent possible bursting in the event the operator neglects to use the simple push-pull clutch on the wheel which allows the handwheel to remain still while the machine is running.

Particular attention has been paid to the safety of the machine and its all important bearings in regard to lubrication. The lower feed rolls run through a bath of oil which is carried to the strip and which in turn lubricates the surfaces of the deflector and coiling rolls. All bearings are lubricated through the Tribon high-pressure system from a single feed station, while the deflector roll bearings each get a shot of oil from a Nathan oiler each time a ring is turned off, or 25 times a minute.

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Practical Engineering Advice

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(Originators of the Steel Setting)
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JERSEY CITY, N. J.

BUYERS' GUIDE, Continued

INHIBITORS—
Wm. M. Parkin & Co., Pittsburgh, Pa.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

LIME—Pulverized
Amer. Lime & Stone Co., Bellefonte, Pa.

LUBRICANTS—Wire Drawing
R. H. Miller & Co., Homer, N. Y.
J. T. Robertson Co., Syracuse, N. Y.

MACHINE—Die Re-cutting and Polishing
Wm. Haddow, Ossining, N. Y.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
Fidelity Machine Co., Phila., Pa.
Hope Narrow Fabric Co., Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt. Co., Providence, R. I.

MACHINERY—Bunching
Amer. Insulating Mach'y Co., Phila., Pa.
Haskell-Dawes Machine Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
Fred'k M. Conran, Newark, N. J.
New England Butt Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Company, Paterson, N. J.

MACHINERY—Chain Making
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Closing
Haskell-Dawes Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coil Winding
Amer. Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Universal Winding Co., Providence, R. I.

MACHINERY—Coiling
Broden Const. Co., Cleveland, O.
Haskell-Dawes Mach. Co., Phila., Pa.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Copper Wire Drawing and Rolling
H. J. Ruesch Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrell Fdry & Machine Co., Waterbury, Conn.

MACHINERY—Cutting
American Insulating Mach'y Co., Phila., Pa.
F. B. Shuster Co., New Haven, Conn.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.

MACHINERY—Extruding
John Robertson Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Forming
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Galvanizing Wire
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Gang Winders
H. J. Ruesch Machine Co., Newark, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Insulating
American Insulating Machinery Co., Phila.
Corone Wire Insulators, Inc., Putnam, Conn.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
John Robertson Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
John Robertson Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Measuring Wire & Cable
Hope Narrow Fabric Co., Providence, R. I.
New England Butt. Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Panning
American Insulating Machinery Co., Phila.

MACHINERY—Pointing
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rivet
Waterbury-Farrell Fdry & Machine Co.,

MACHINERY—Rod
Fred'k M. Conran, Newark, N. J.
Morgan Const. Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrell Fdry & Machine Co., Waterbury, Conn.

MACHINERY—Rubber Strip Covering
American Ins. Mach'y Co., Phila., Pa.
Corone Wire Insulators, Inc., Putnam, Conn.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
Corone Wire Insulators, Inc., Putman, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry and Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
Fred'k M. Conran, Newark, N. J.
American Insulating Machinery Co., Phila.
Hope Narrow Fabric Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Spring Making
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
H. J. Ruesch Machine Co., Newark, N. J.
F. B. Shuster, New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Straightening Hollow Wire
Fred'k M. Conran, Newark, N. J.

MACHINERY—Stranding
American Insulating Mach'y Co., Phila Pa.
Fred'k M. Conran, Newark, N. J.
Haskell-Dawes Machine Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

Carboloy Opens Detroit Die Plant

Effective September 1st, 1931, an additional Carboloy drawing and extrusion die manufacturing unit will start operating at 2481 East Grand Boulevard, Detroit, Michigan, according to an announcement received from the Carboloy Company, Inc.

The addition of this new plant to supplement the units now at 144 Orange Street, Newark N. J. and 704 Second Avenue, Pittsburgh, Pa. enables the Carboloy Die Division to effectively serve the middle west and makes available three manufacturing and service units at convenient locations within reach of all wire and tube mills in the country.

The plants have the latest die manufacturing equipment developed by Carboloy since its inception in the die business, making possible the finest type of precision work necessary for maximum die performance.

One of the outstanding features of the manufacturing facilities available is that uniformity of die shape can be obtained , assuring the user reproductions of original dies at all times.

Increase in new business since the announcement on June 1st, 1931 of revised prices on Carboloy dies, was an important factor affecting the decision to further extend Carboloy Die Manufacturing and service units, the company announces.

Packard Electric Co., Warren, O., has been awarded 60,000 feet electric single-conductor cable for the naval aircraft factory, Philadelphia, on bids of $3.96 and $4.23 per thousand feet.

BUYERS' GUIDE, Continued

MACHINERY—Strip Steel
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Swaging
H. J. Ruesch Machine Co., Newark, N. J.
Sleeper & Hartley, Worcester, Mass.
Waterbury-Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Taping
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Company, Paterson, N. J.

MACHINERY—Testing Die Traction
Robert Miller, Philadelphia, Pa.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Fred'k M. Conran, Newark, N. J.
H. J. Ruesch Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrell Fdry. & Machine Co., Waterbury, Conn.

MACHINERY—Welding Wire
Micro Products Co., Peoria, Ill.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Universal Winding Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Insulating Machinery Co., Phila.
Broden Const. Co., Cleveland, Ohio.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Manufacturing Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Watson Machine Company, Paterson, N. J.

PACKING—Metallic Fibre
Hudson Wire Co., Ossining, N. Y.

POINTERS—Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

POTS—Lead Melting
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Encasing
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

PULLERS—Wire
E. J. Scudder Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
John Robertson Co., Brooklyn, N. Y.

REELS AND SPOOLS—All Kinds
R. B. Hayward Co., Chicago, Ill.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

REEL AND TENSION STAND—
Sleeper & Hartley Inc., Worcester, Mass.

REEL CRUTCHES
R. B. Hayward Co., Chicago, Ill.
Watson Machine Co., Paterson, N. J.

ROLLING MILLS
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
H. J. Ruesch Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrell Foundry & Machine Co., Waterbury, Conn.

SOAPS—Wire Drawing
R. H. Miller Co., Homer, N. Y.
J. T. Robertson Co., Syracuse, N. Y.

SOLDER—Silver
Handy & Harman, N. Y.

SPOOLS—Annealing—Detachable Head Handling—Wire Stitching
Mossberg Pressed Steel Corp., Attleboro, Mass.

TRUCKS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS
H. J. Ruesch Machine Co., Newark, N. J.

VULCANIZERS
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WIRE—Various Kinds
Hudson Wire Co., Ossining, N. Y.

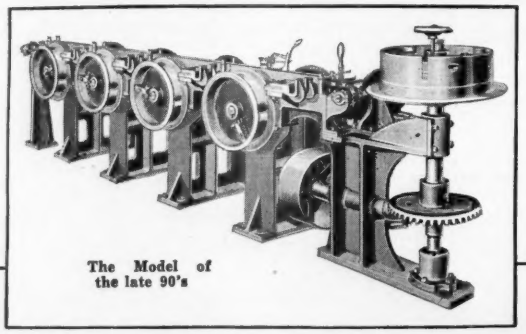
This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in WIRE & WIRE PRODUCTS. Please mention WIRE when writing to these firms.

WATERBURY-FARREL TANDEMS

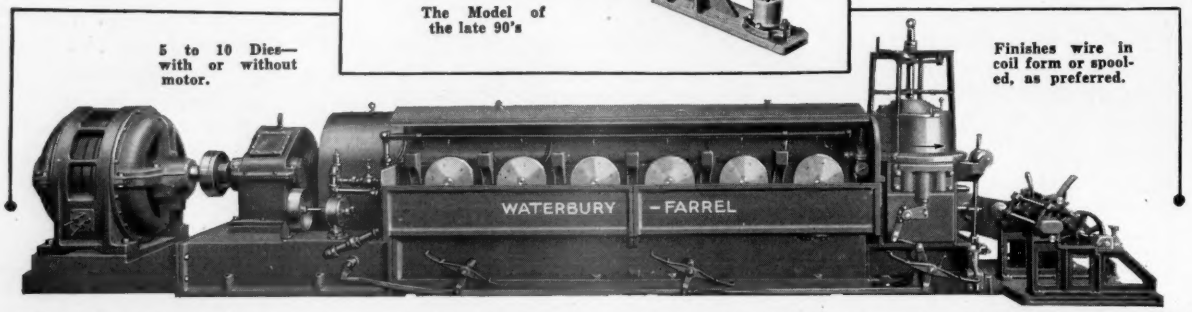
Three Decades Perfecting Continuous Wire Drawing Machines

We thought the old machines were pretty good in the old days (and they were) but times have changed. Today we offer not a better method nor a new principle, but—a far better machine that meets in eloquent fashion every demand of the present day—

High Speed
Low Operating Cost
Mechanical Efficiency



The Model of the late 90's



No. 1 Machine. Forced feed lubrication. Ball Bearings throughout. Starting size, 5/16" copper rod.

The Waterbury Farrel Foundry and Machine Company

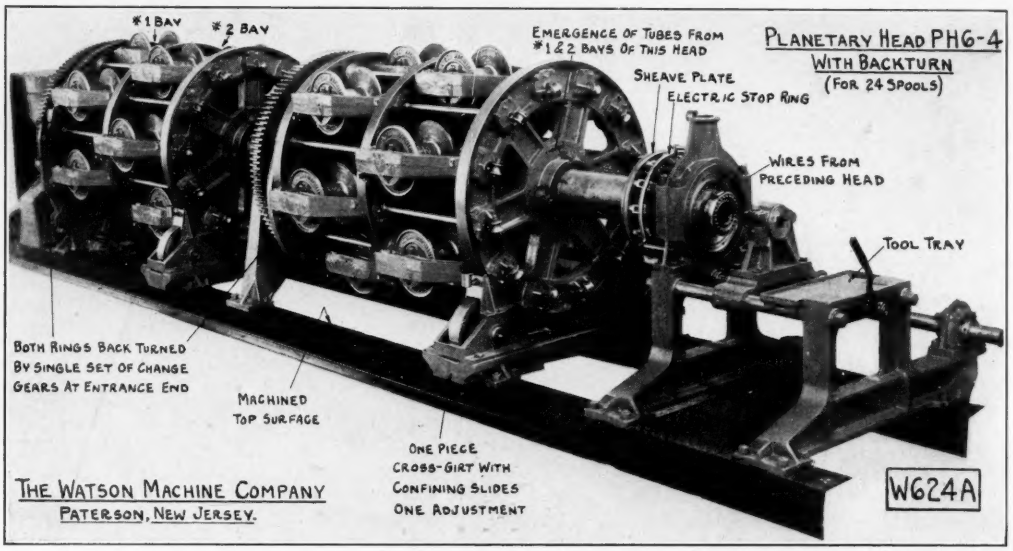
Home Office and Works: Cottage Place, Waterbury, Connecticut **Western Sales Office: Cleveland, Ohio**

THE WATSON MACHINE COMPANY

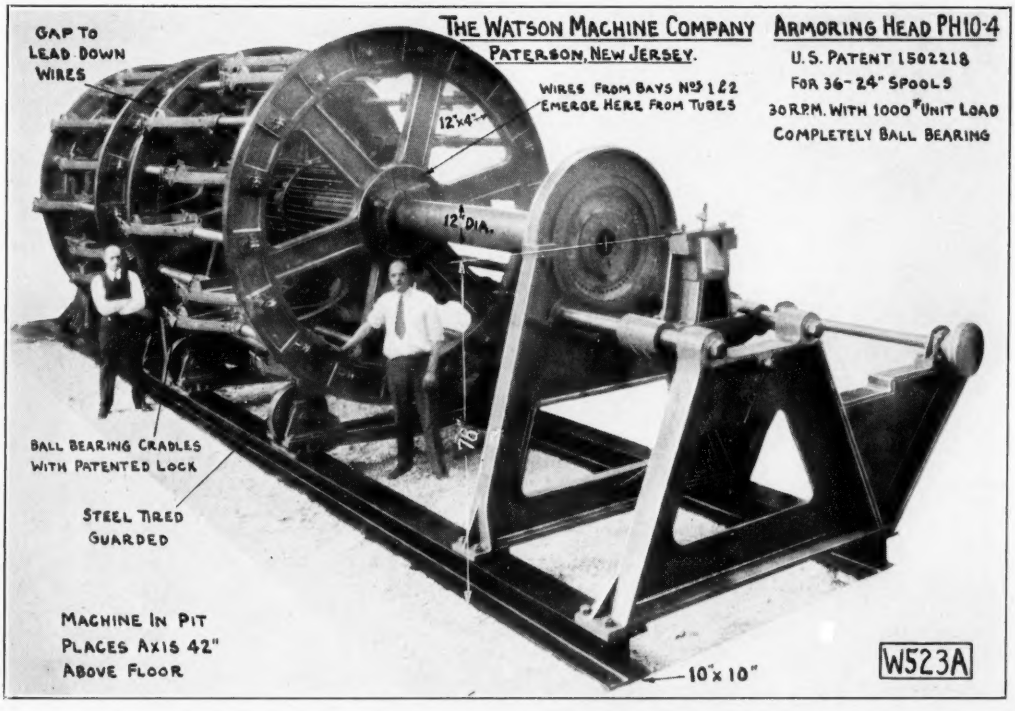
ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

ENGINEERS - FOUNDERS - MACHINISTS

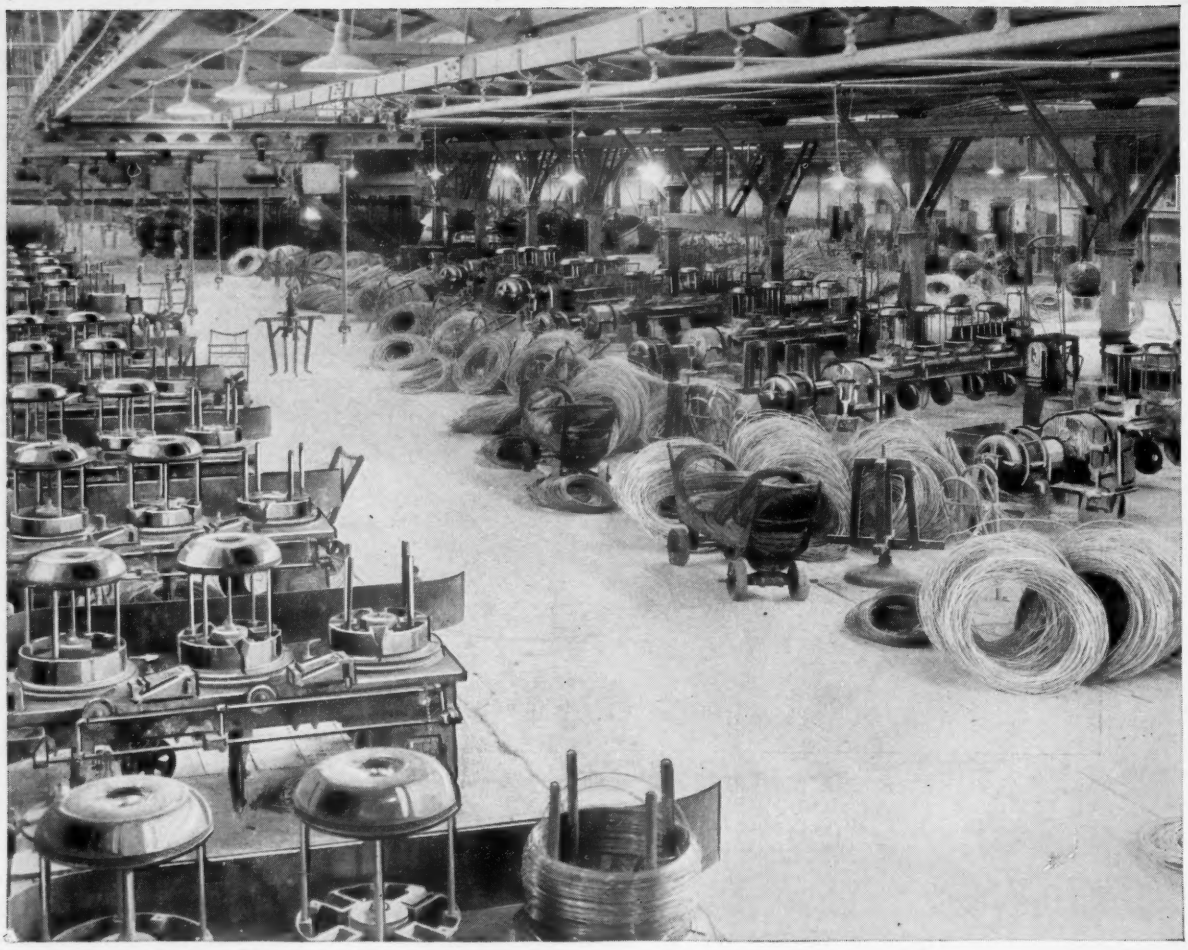

#1 BAY
#2 BAY
EMERGENCE OF TUBES FROM #1 & 2 BAYS OF THIS HEAD
PLANETARY HEAD PH6-4
WITH BACKTURN
(FOR 24 SPOOLS)
SHEAVE PLATE
ELECTRIC STOP RING
WIRES FROM PRECEDING HEAD
TOOL TRAY
BOTH RINGS BACK TURNED BY SINGLE SET OF CHANGE GEARS AT ENTRANCE END
MACHINED TOP SURFACE
ONE PIECE CROSS-GIRT WITH CONFINING SLIDES ONE ADJUSTMENT
THE WATSON MACHINE COMPANY
PATERSON, NEW JERSEY.
W624A

PLANETARY HORIZONTAL STRANDING HEADS in 100, 250 and 500 pound series; for 6, 12, 18, 24, 30 and 36 spools in each series. All Anti-Friction Bearings (including Cradle Necks), with positive elimination of spool side-slap allowing highest speeds. Automatic stops and brakes, low wire lead angles, positive locks preventing operation with unlocked spools. Lang lay attachment at low extra cost.



PLANETARY HORIZONTAL ARMORING HEADS in 500 and 1000 pound series, for up to 54 spools in each series. Same construction as on Stranding Heads.

ELECTRICAL WIRE AND CABLE, WIRE ROPE AND CORDAGE MACHINERY



Morgan-Connor Wire Machines

MORGAN CONSTRUCTION CO.,
Worcester, Mass., U. S. A.

Sole licensee for Morgan-Connor Wire Machines in Europe

MALMEDIE & COMPANY

Maschinenfabrik Aktiengesellschaft **Dusseldorf, Germany**

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